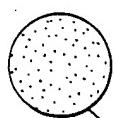


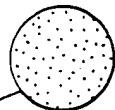


FIG. 1



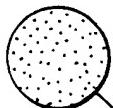
[SEQ. ID NO: 3]

X-C-C-T-T-G-A-G-A-T-T-T-C-C-C-T-C
5' 3'



G-G-A-A-C-T-C-T-A-A-A-G-G-G-A-G-X
3' 5'

[SEQ. ID NO: 4]



X-C-C-T-T-G-A-G-A-T-T-T-C-C-C-T-C
G-G-A-A-C-T-C-T-A-A-A-G-G-G-A-G-X

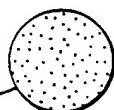


FIG. 2

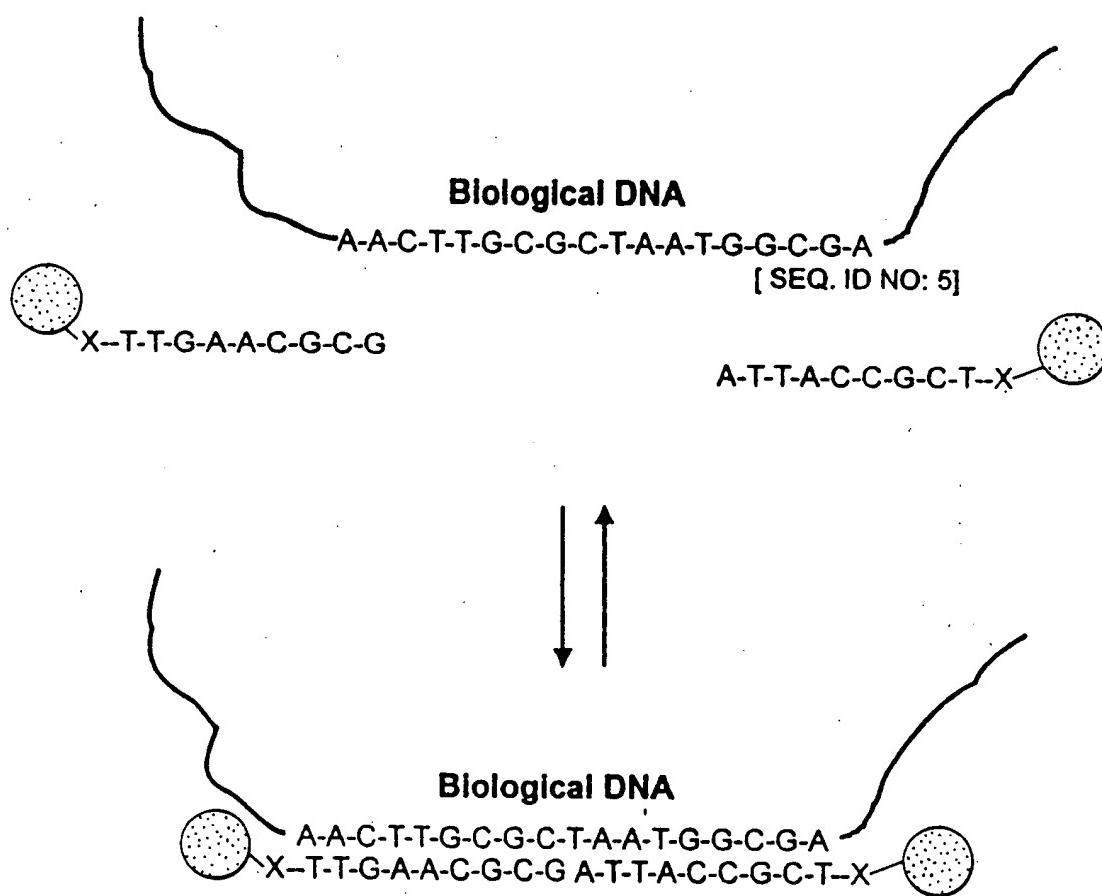
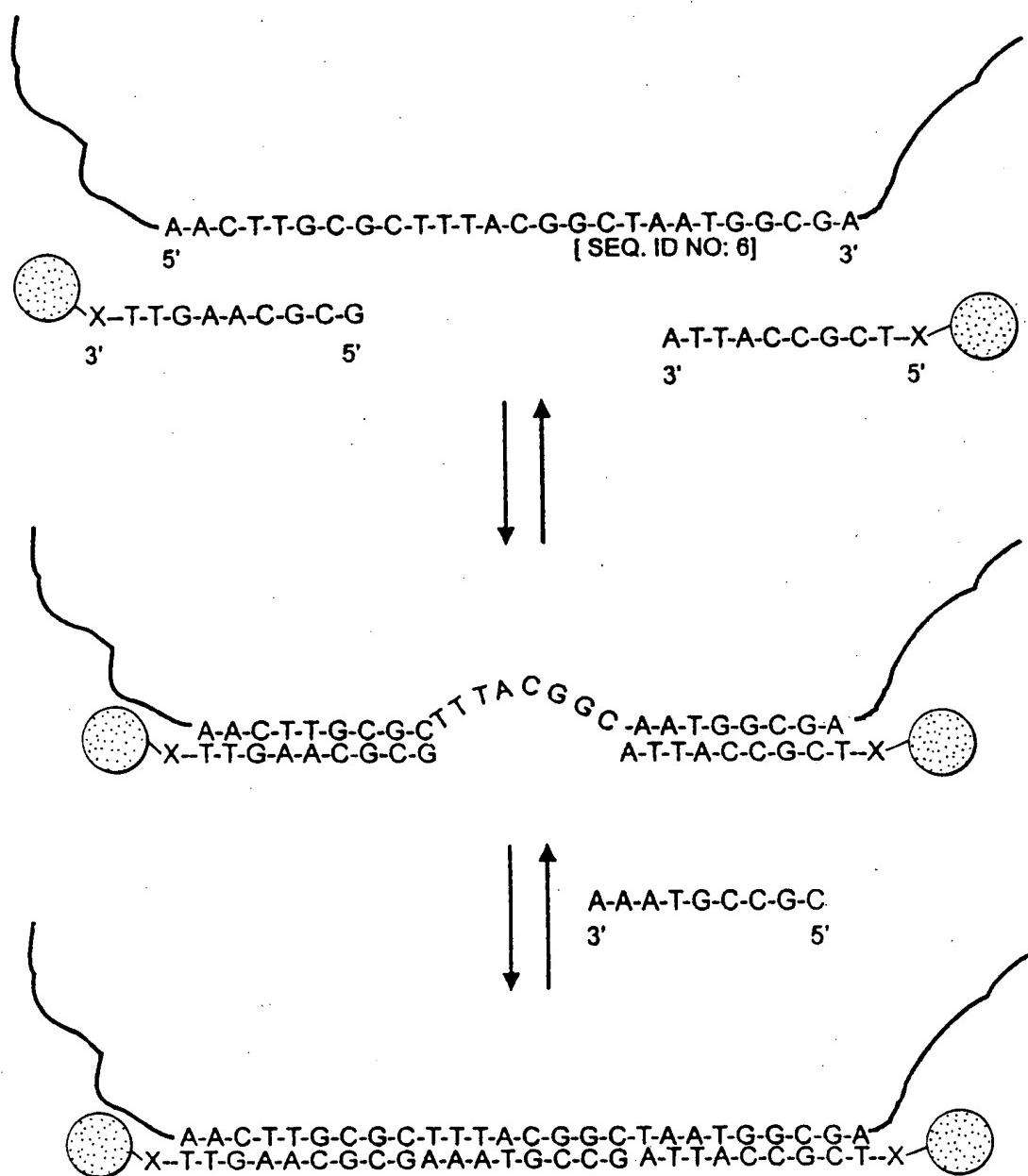


FIG. 3



Linking oligonucleotide

A-T-G-G-C-A-A-C-T-A-T-A-C-G-C-T-A-G
A-T-A-T-G-C-G-C-G-A-T-C-T-C-A-G-C-A-A-A
[SEQ. ID NO: 2] ↗
[SEQ. ID NO: 1] ↗

FIG. 4

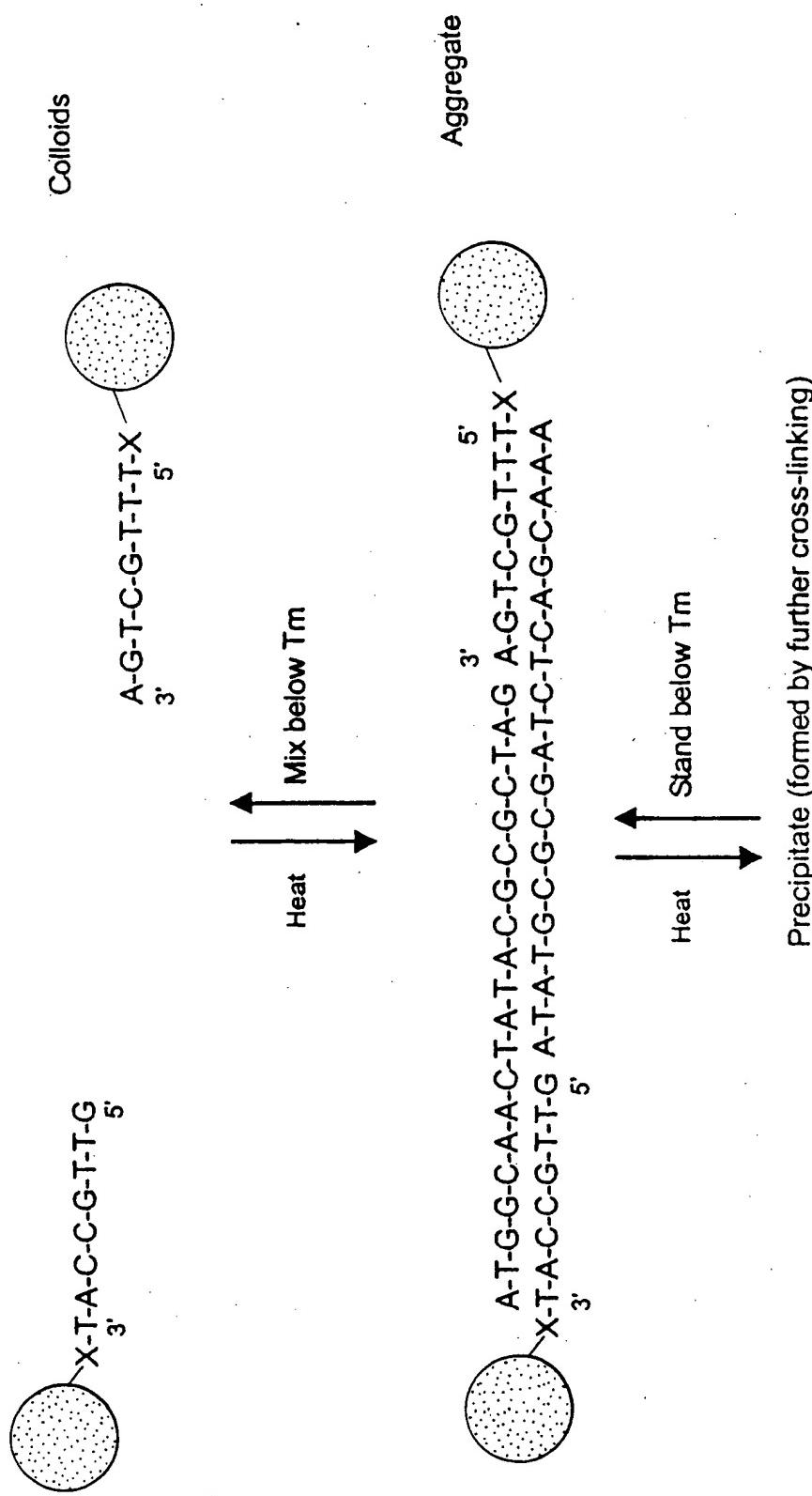


FIG. 5

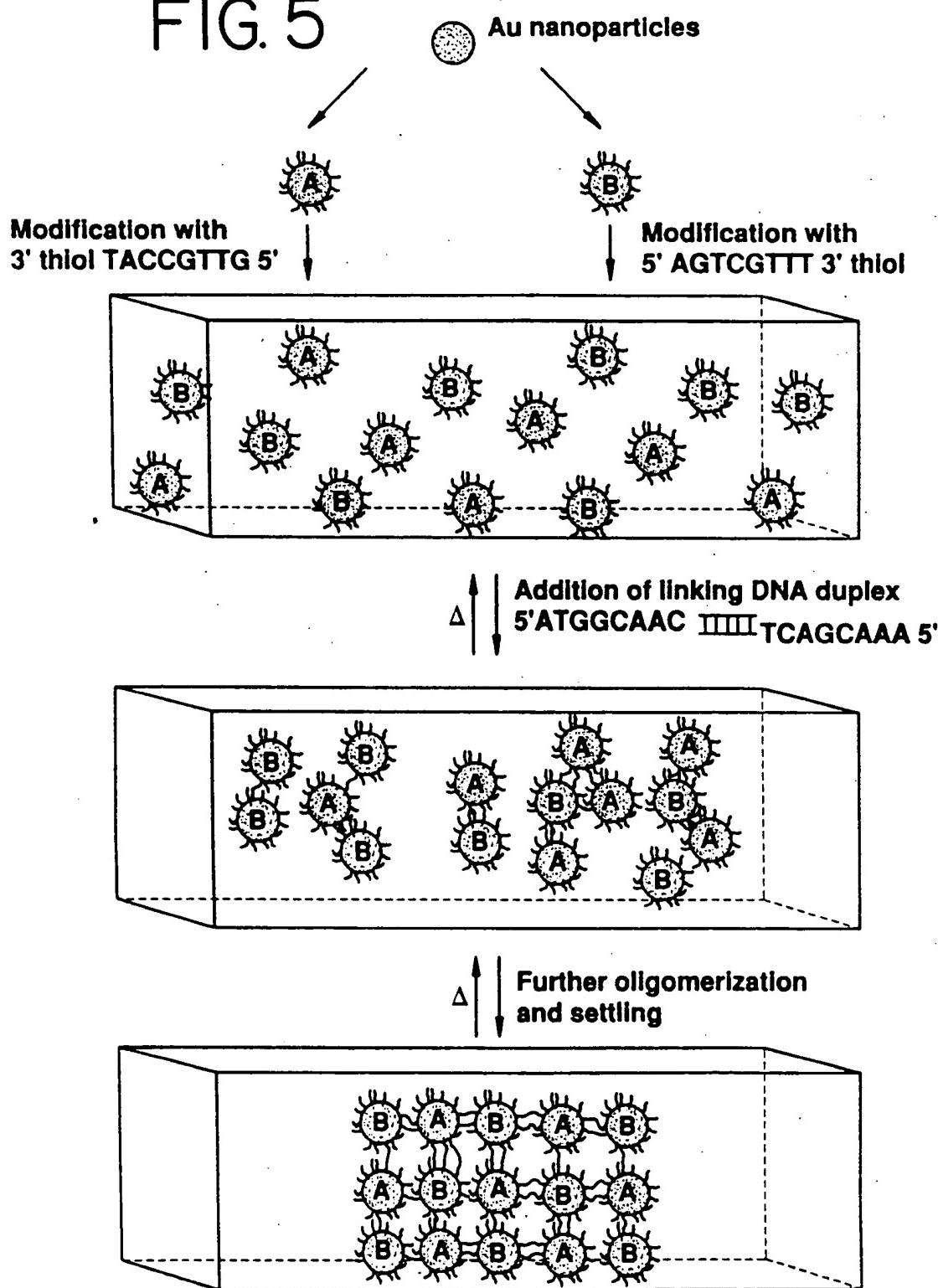


FIG. 6A FIG. 6B FIG. 6C



FIG. 7

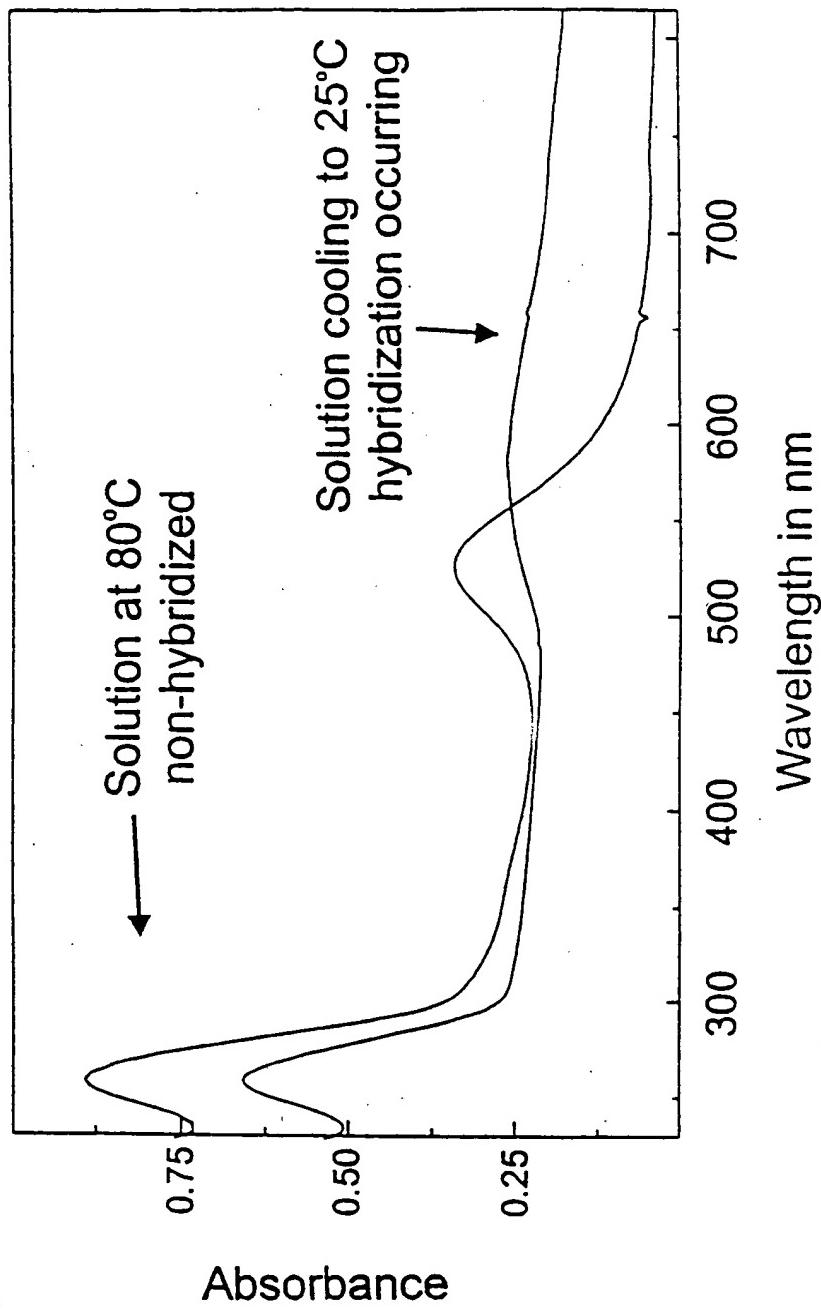


FIG. 8A

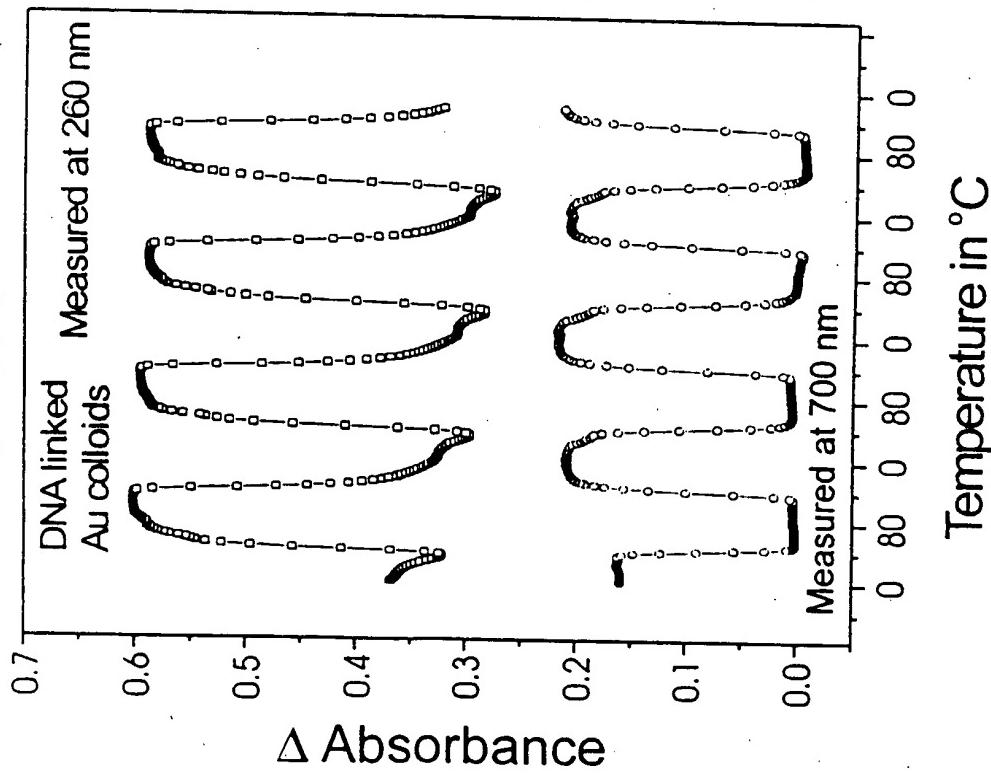


FIG. 8B

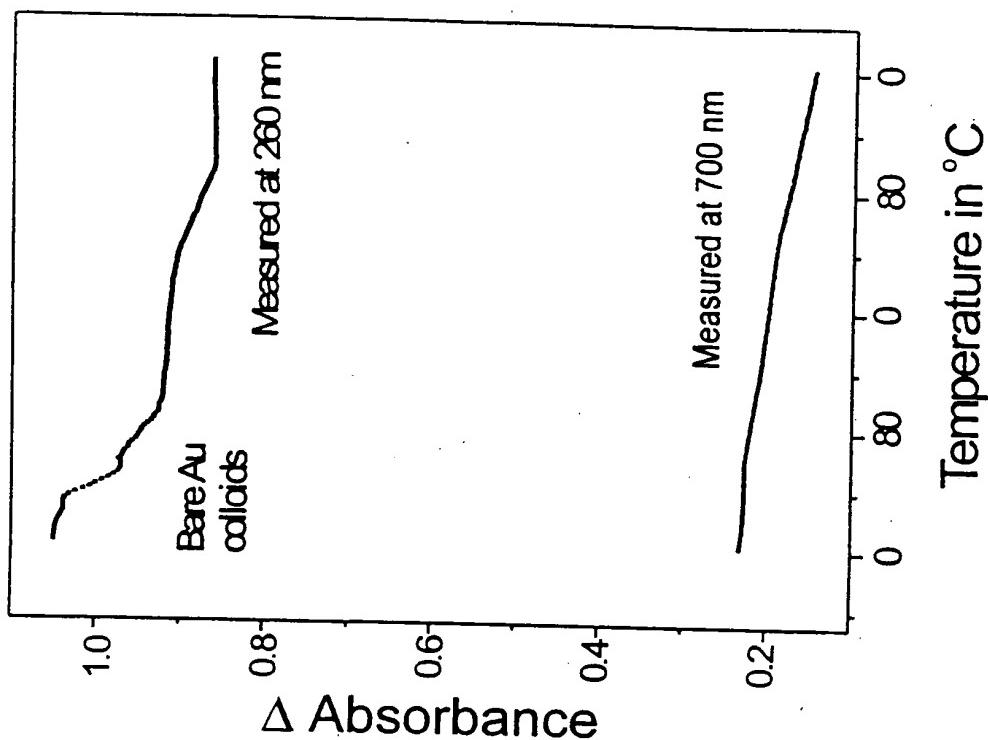


FIG. 9A

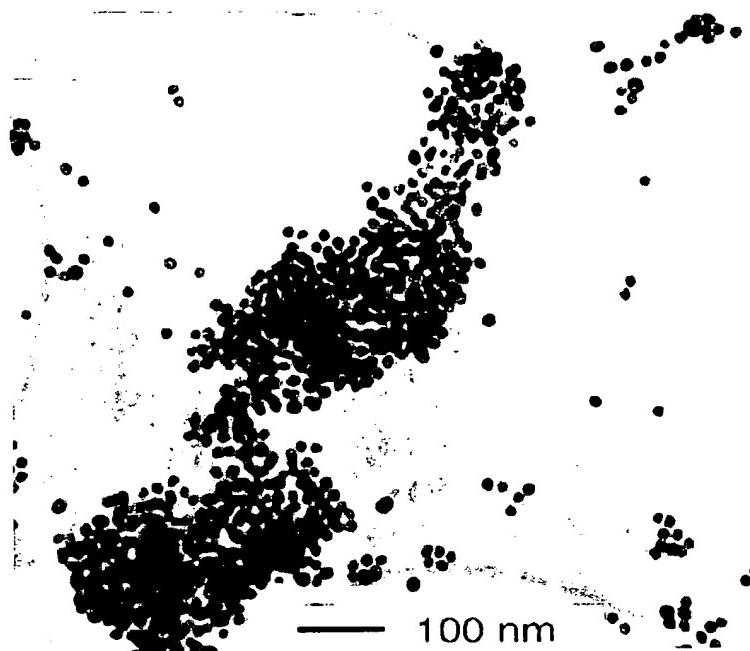


FIG. 9B

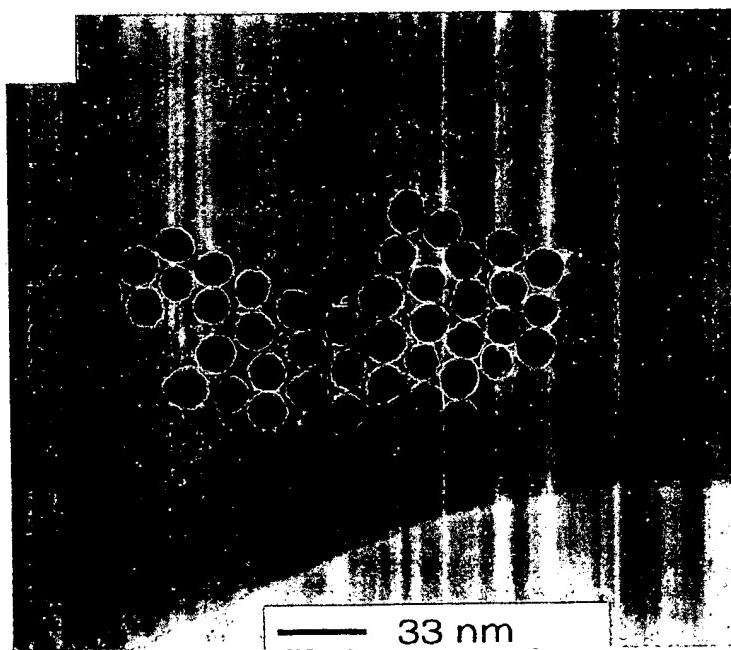
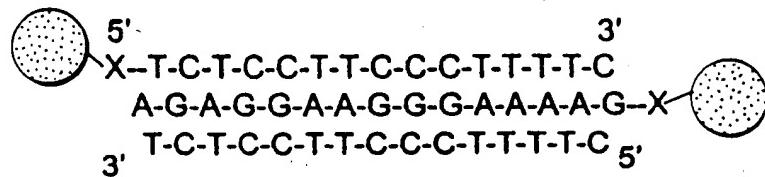
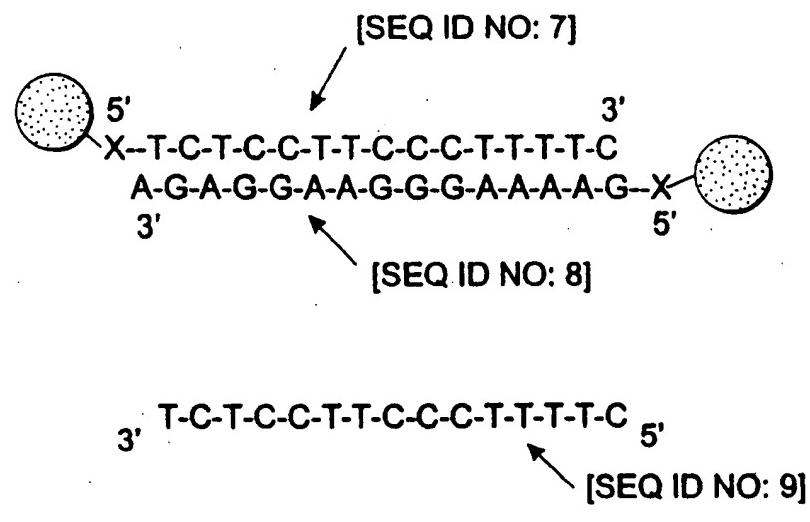


FIG. 10



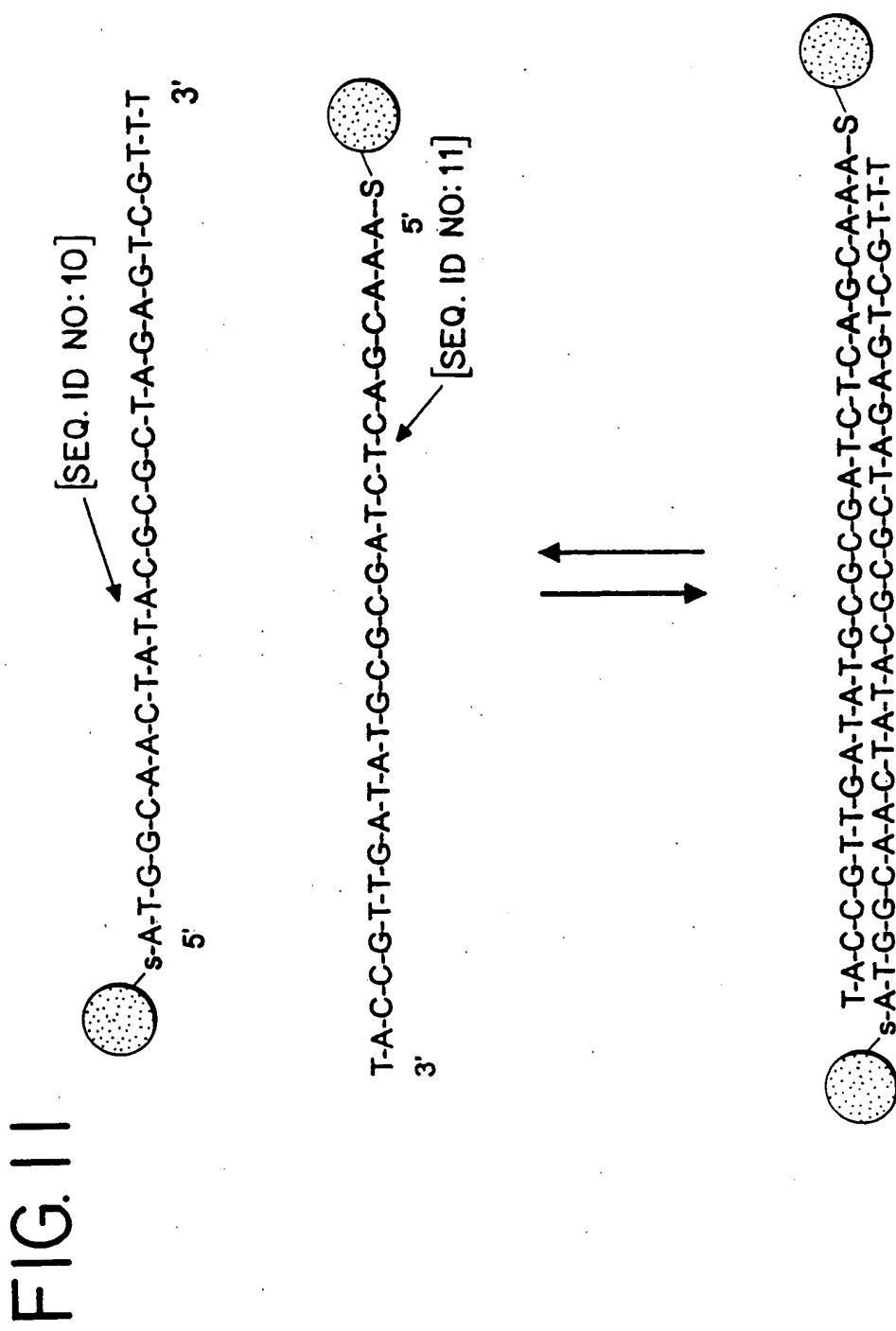


FIG. 12A

Complementary Target

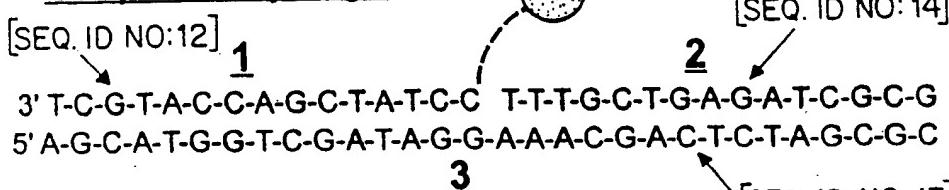


FIG. 12B

Probes without Target

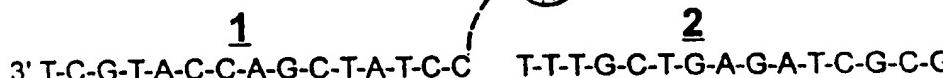


FIG. 12C

Half Complementary Target

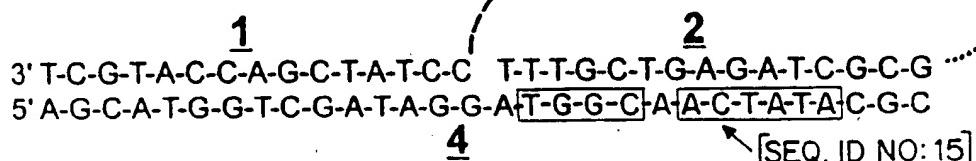


FIG. 12D

Target - 6 bp

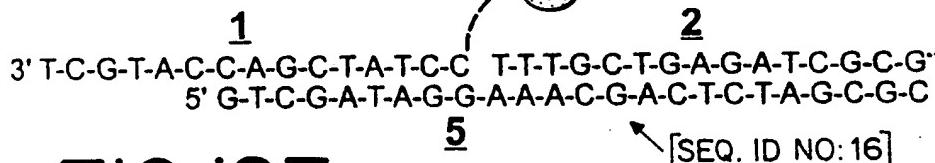


FIG. 12E

One bp Mismatch

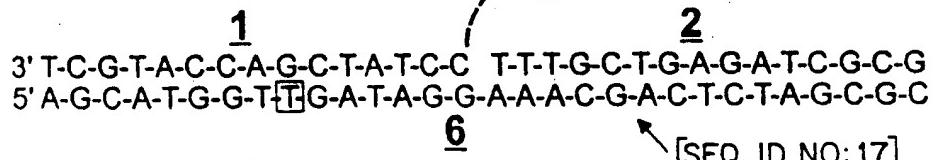


FIG. 12F

Two bp Mismatch

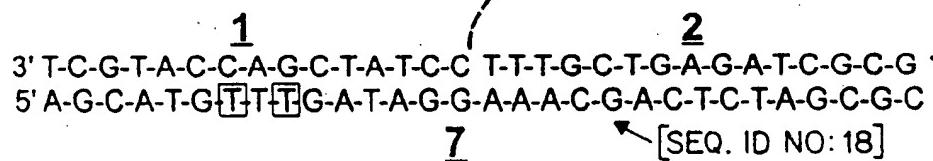


FIG. 13A

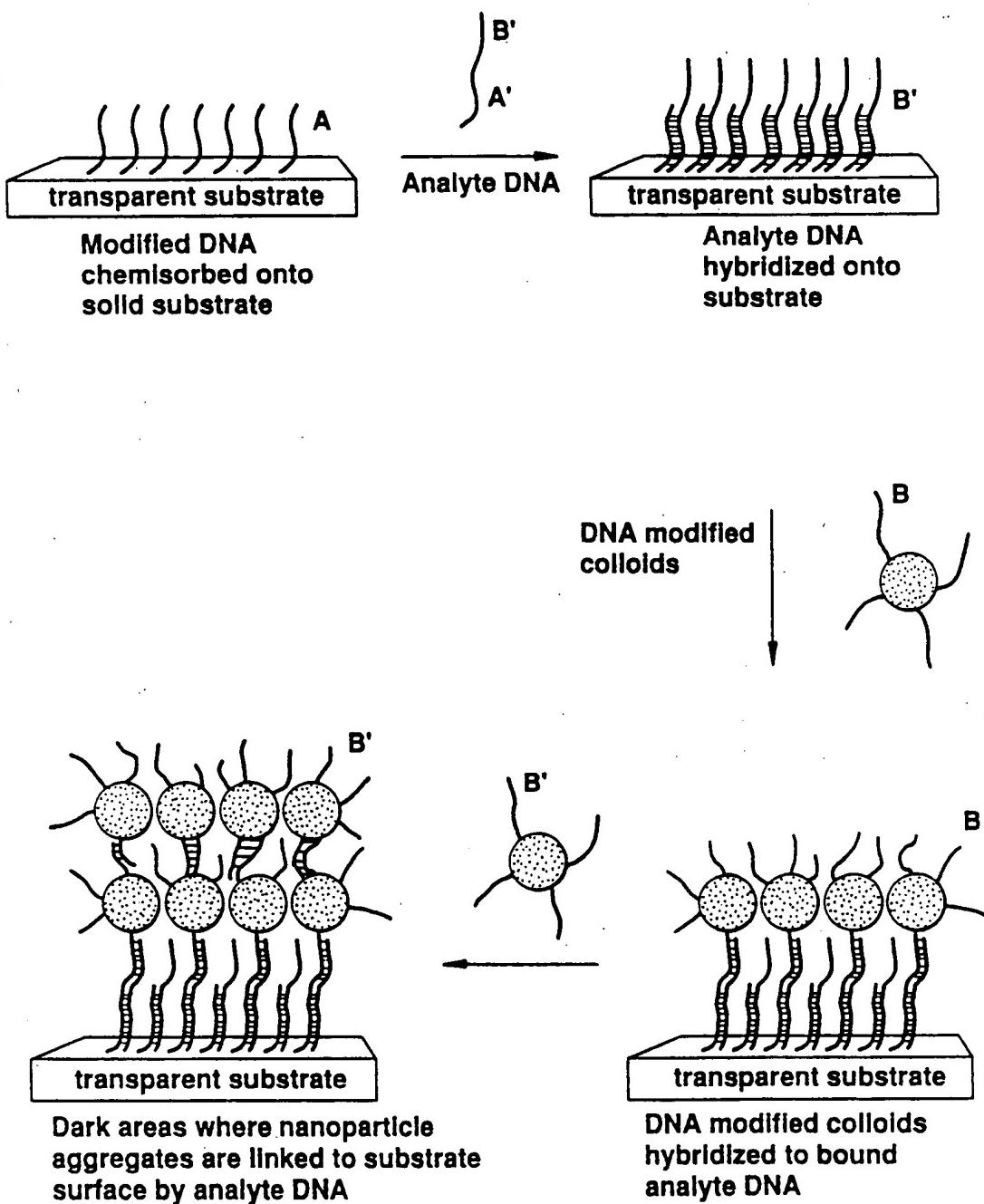


FIG. 13B

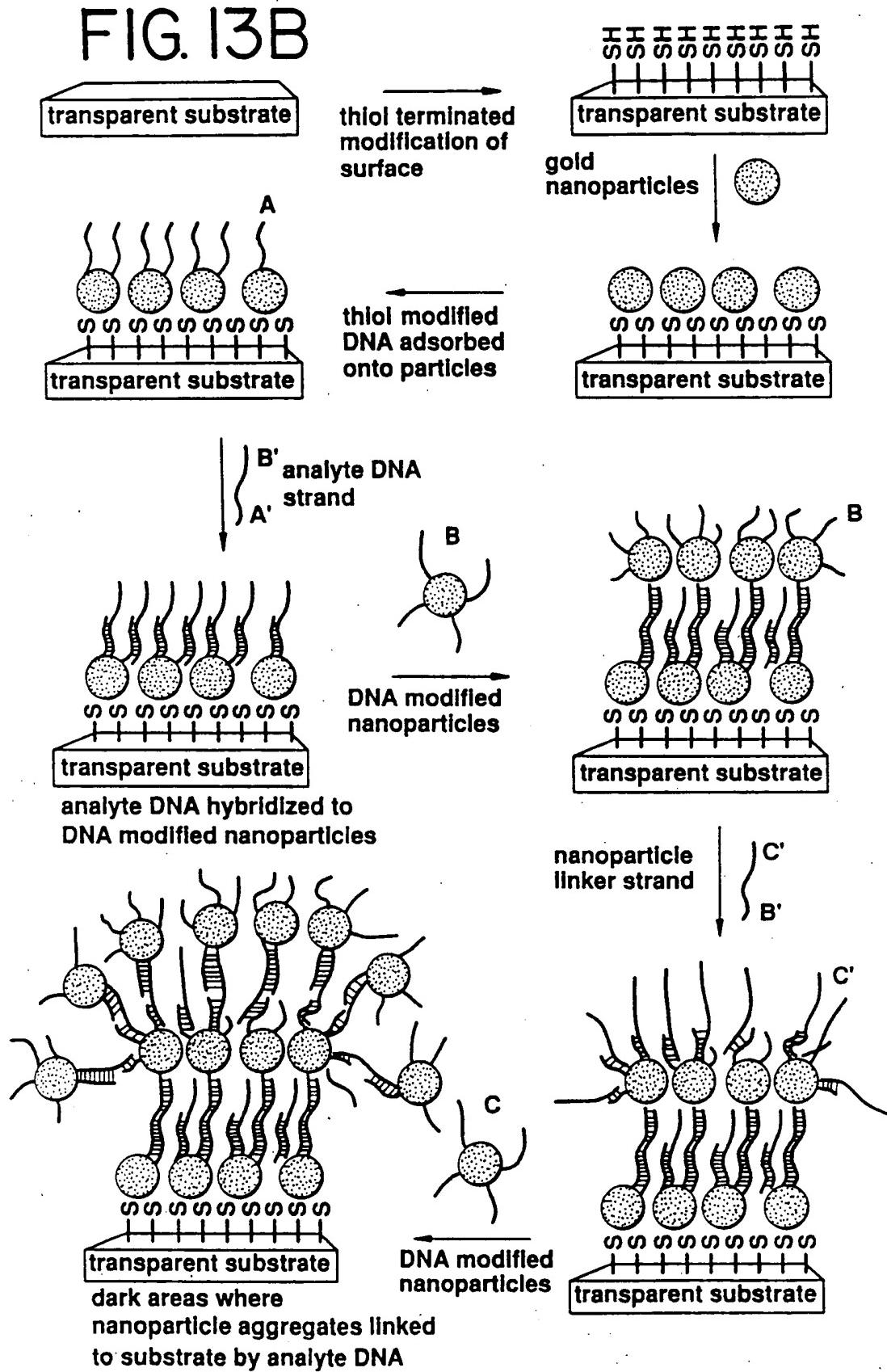


FIG. 14A

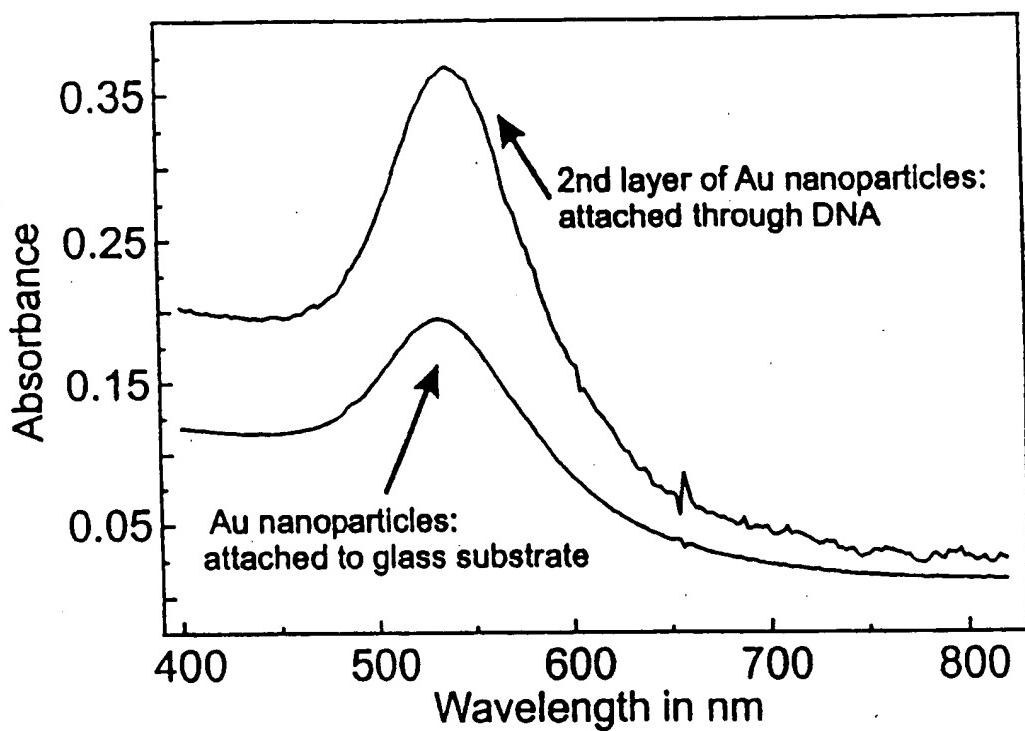


FIG. 14B

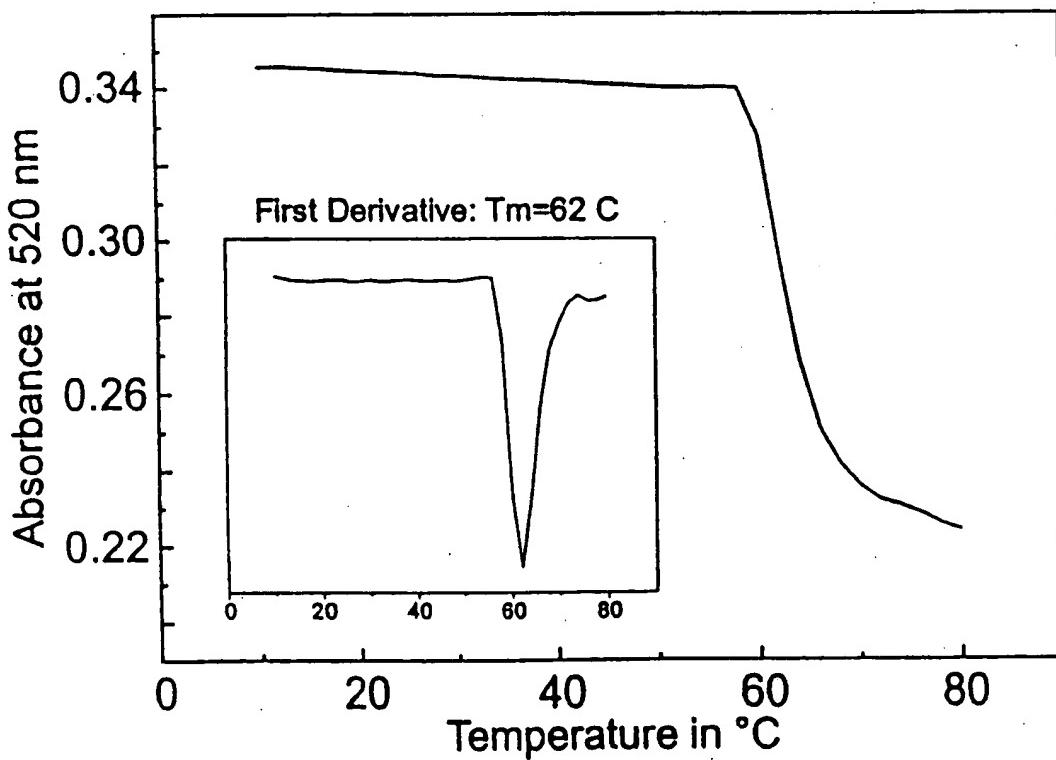


FIG. 15A

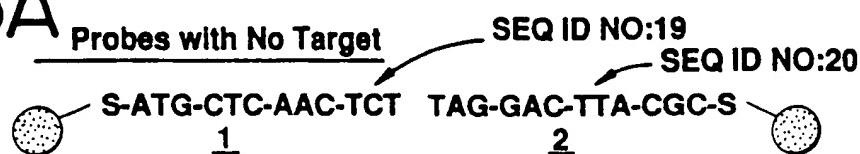


FIG. 15B

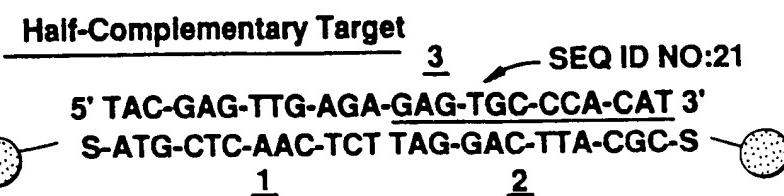


FIG. 15C

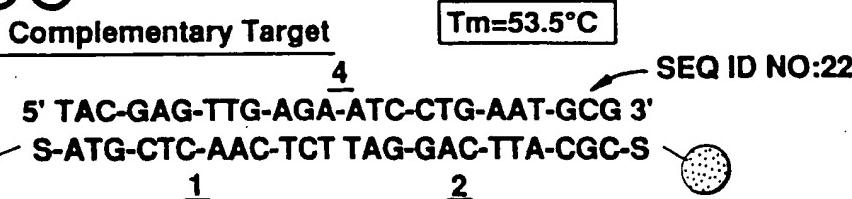


FIG. 15D

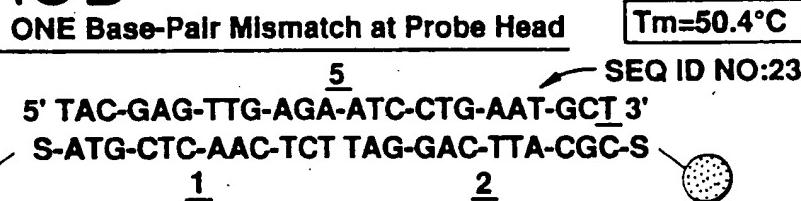


FIG. 15E

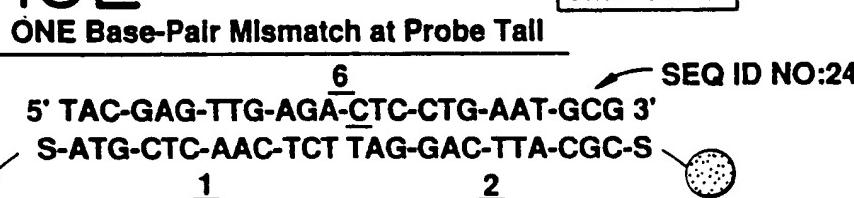


FIG. 15F

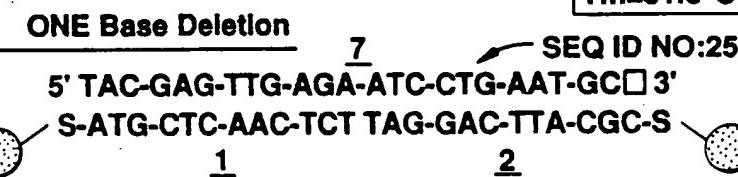


FIG. 15G

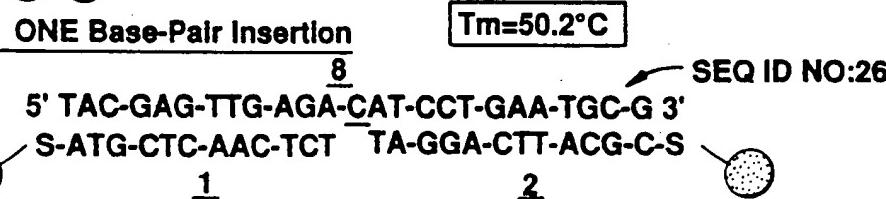


FIG. 16A

24 Base Template

5' TAC-GAG-TTG-AGA-ATC-CTG-AAT-GCG 3'
—S-ATG-CTC-AAC-TCT TAG-GAC-TTA-CGC-S —
1 2

FIG. 16B

48 Base Template with Complementary 24 Base Filler

5' TAC-GAG-TTG-AGA-CCG-TTA-AGA-CGA-GCG-AAT-CAT-GCA-ATC-CTG-AAT-GCG 3'
—S-ATG-CTC-AAC-TCT GGC-AAT-TCT-GCT-CCG-TTA-GTA-CGT TAG-GAC-TTA-CGC-S —
1 2

FIG. 16C

72 Base Template with Complementary 48 Base Filler

5' TAC-GAG-TTG-AGA-CCG-TTA-AGA-CGA-GGC-AAT-CAT-GCA-TAT-ATT-GGA-CGC-TTT-ACG-GAC-AAC-ATC-CTG-AAT-GCG 3'
—S-ATG-CTC-AAC-TCT GGC-AAT-TCT-GCT-CCG-TTA-GTA-CGT-ATA-TAA-CCT-GCG-AAA-TGC-CTG-TTG TAG-GAC-TTA-CGC-S —
1 2

FIG. 17B

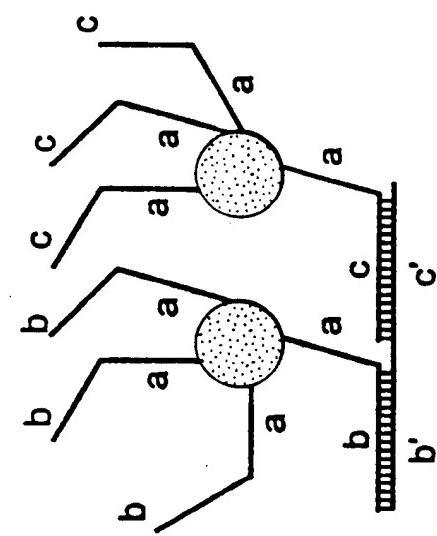


FIG. 17A

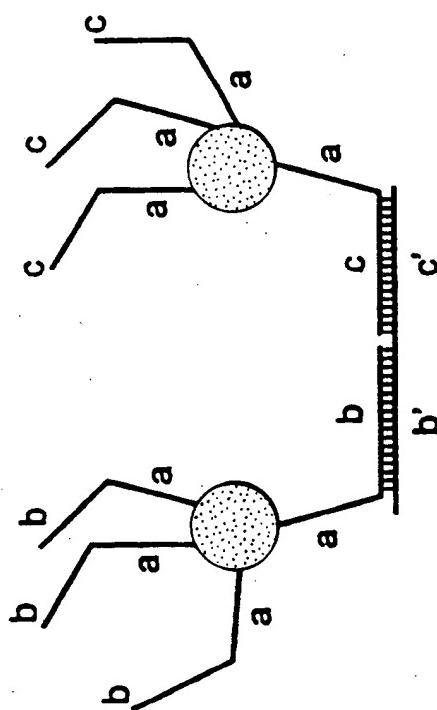


FIG. 17C

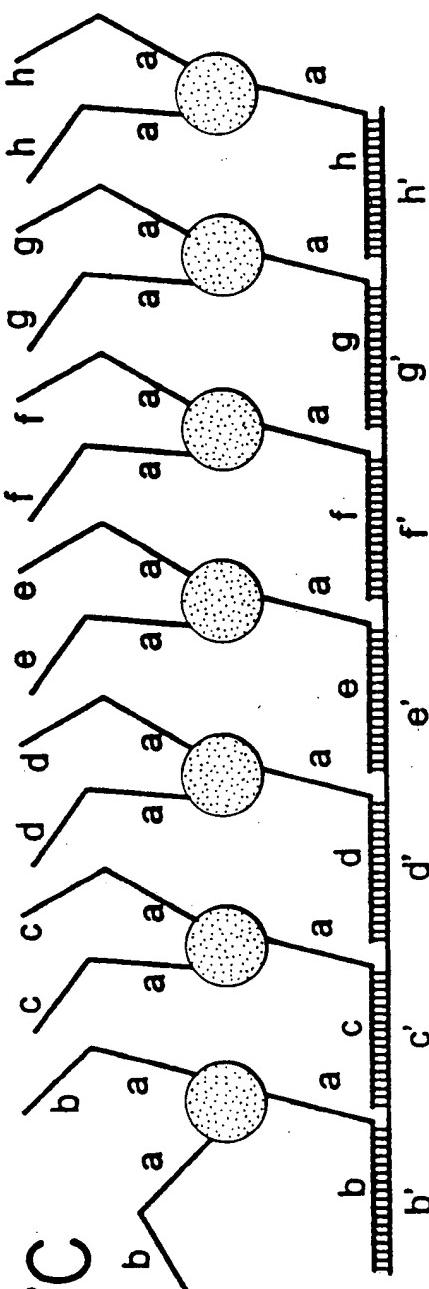


FIG. 17D

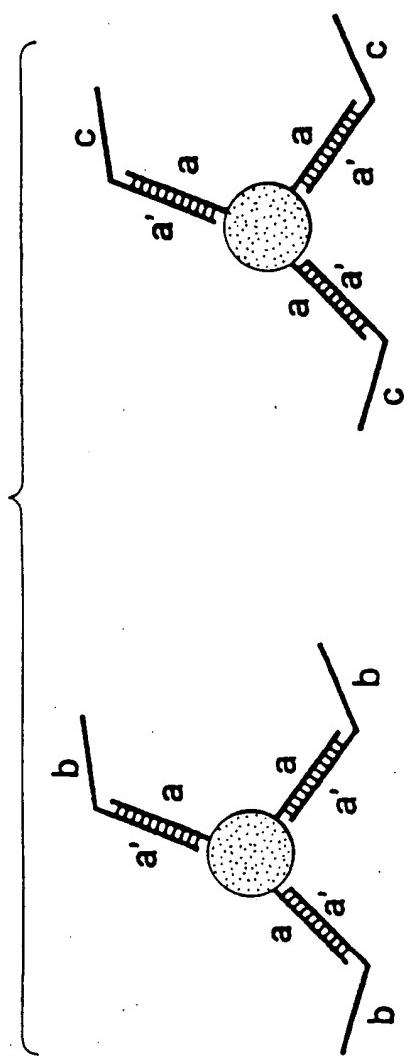


FIG. 17E

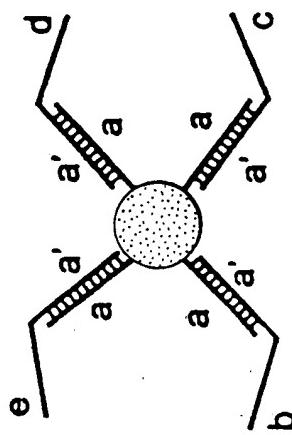


FIG. 18

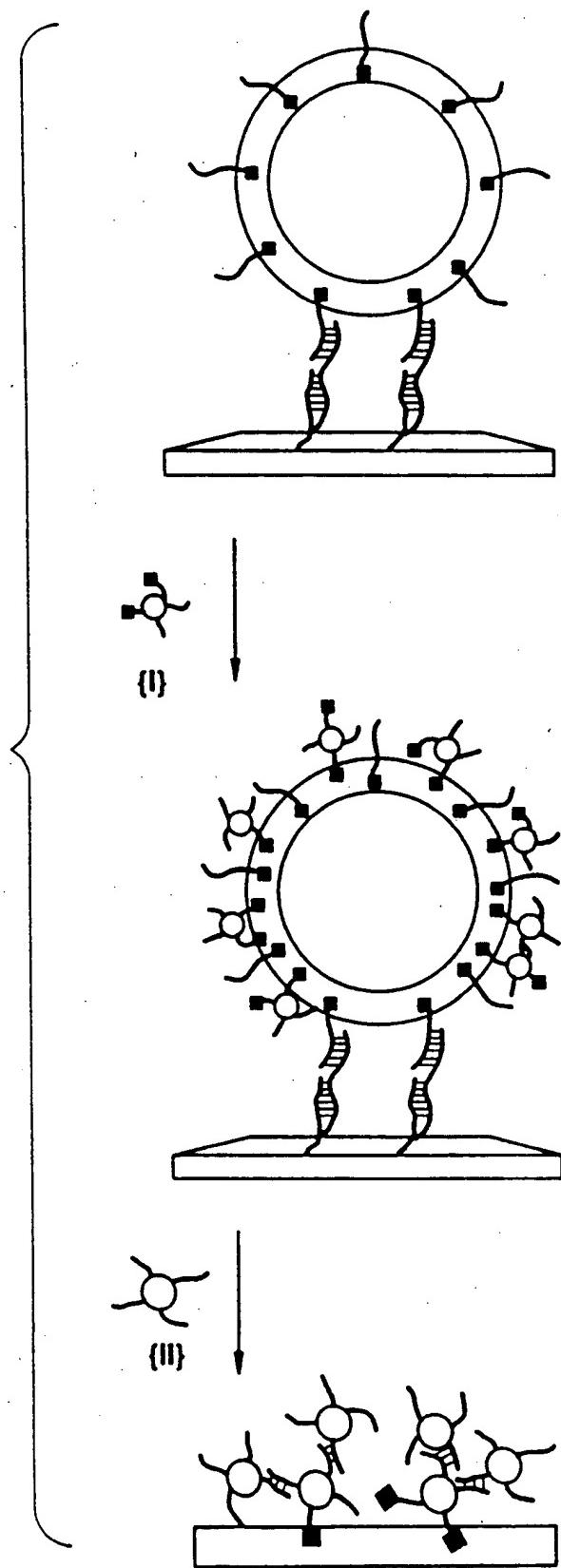


FIG. 19A

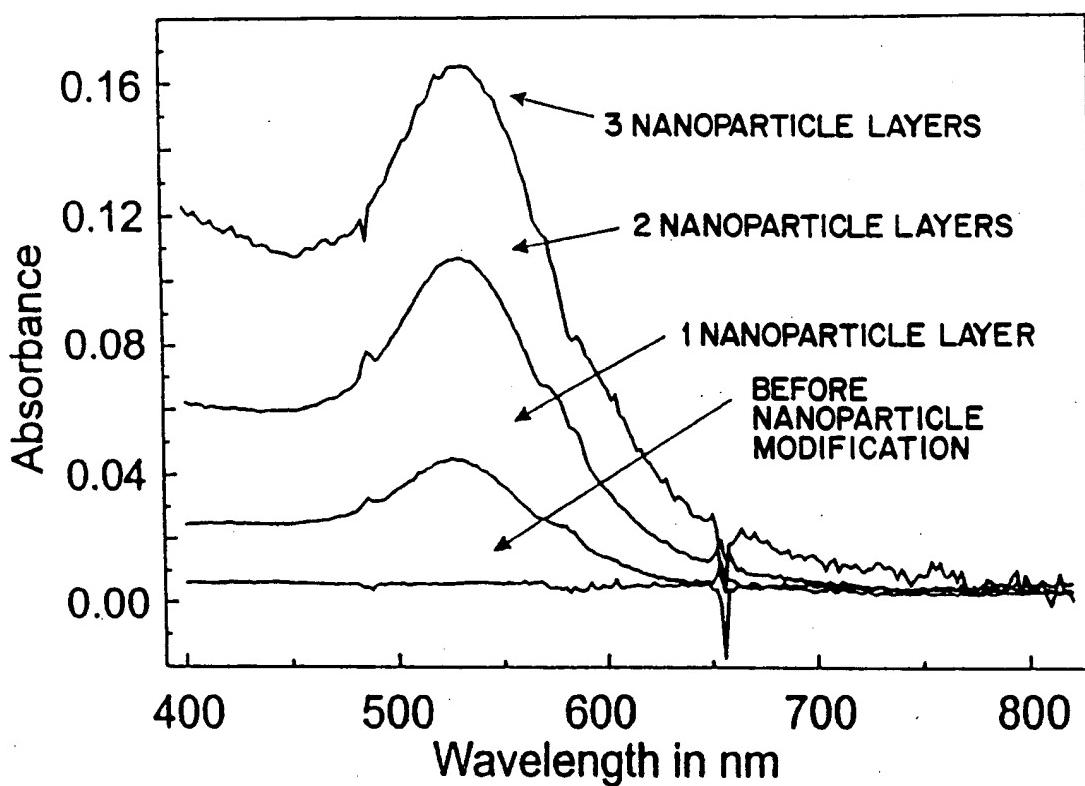


FIG. 19B

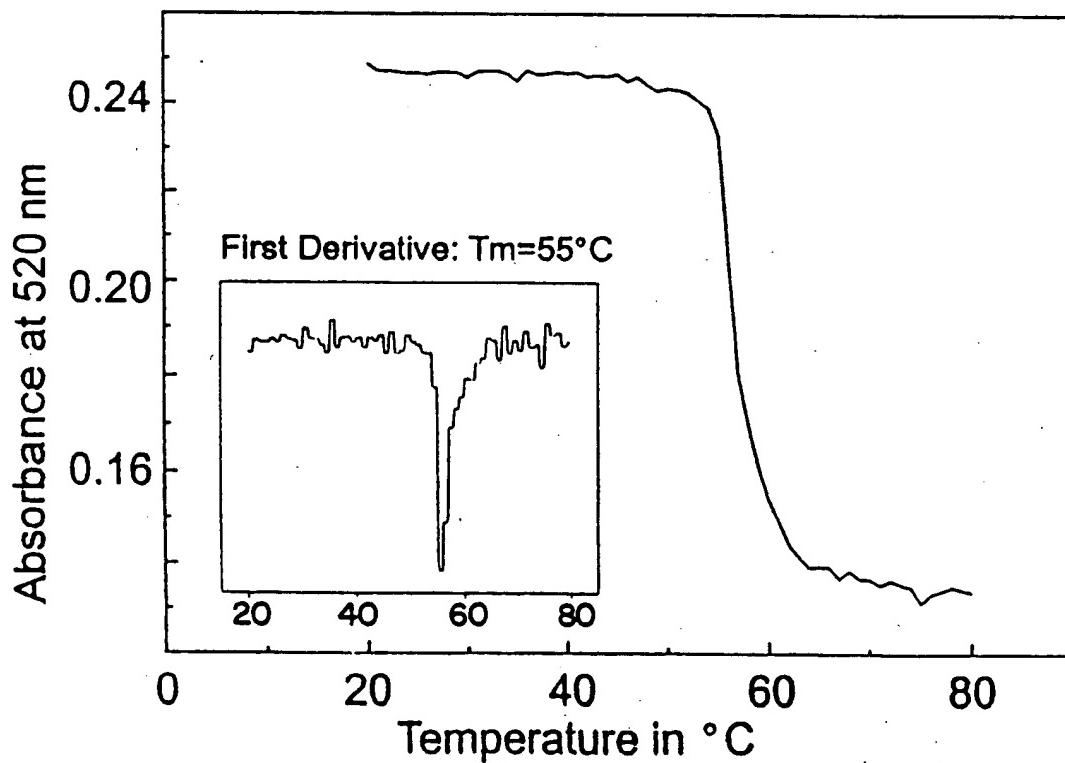


FIG. 20A

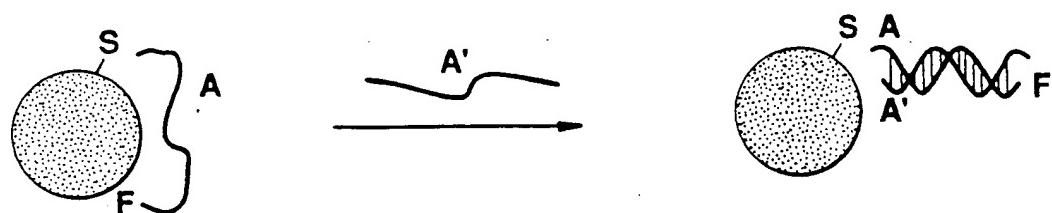


FIG. 20B

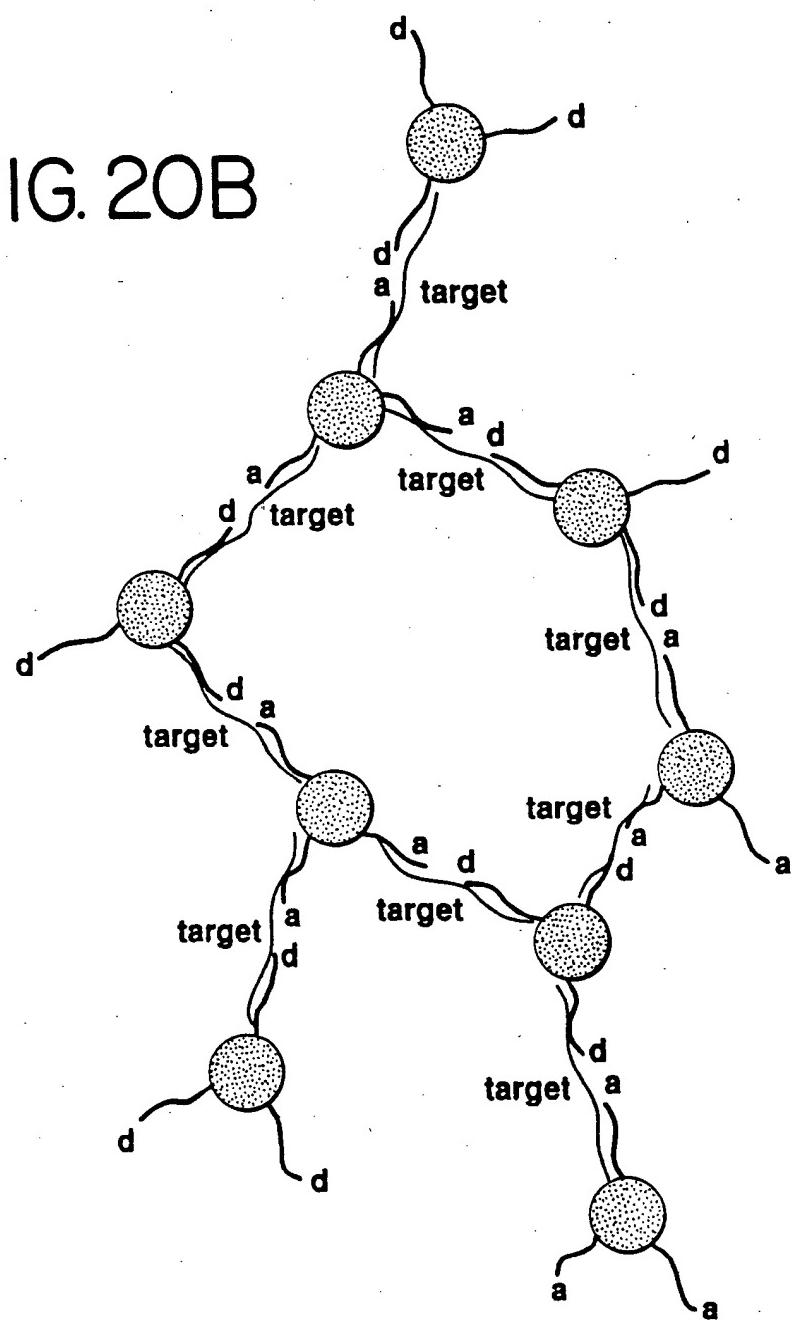


FIG. 21

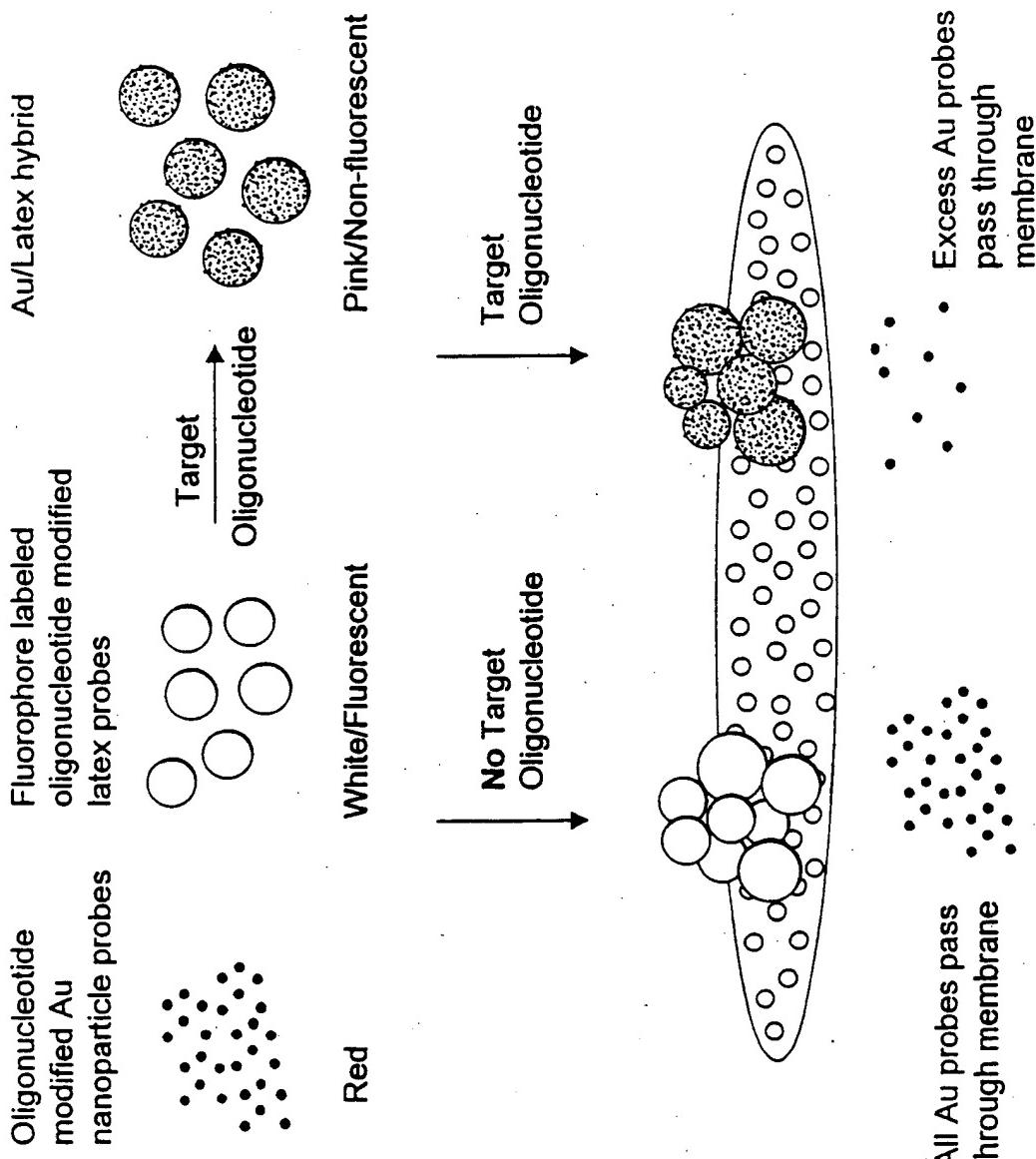


FIG. 22

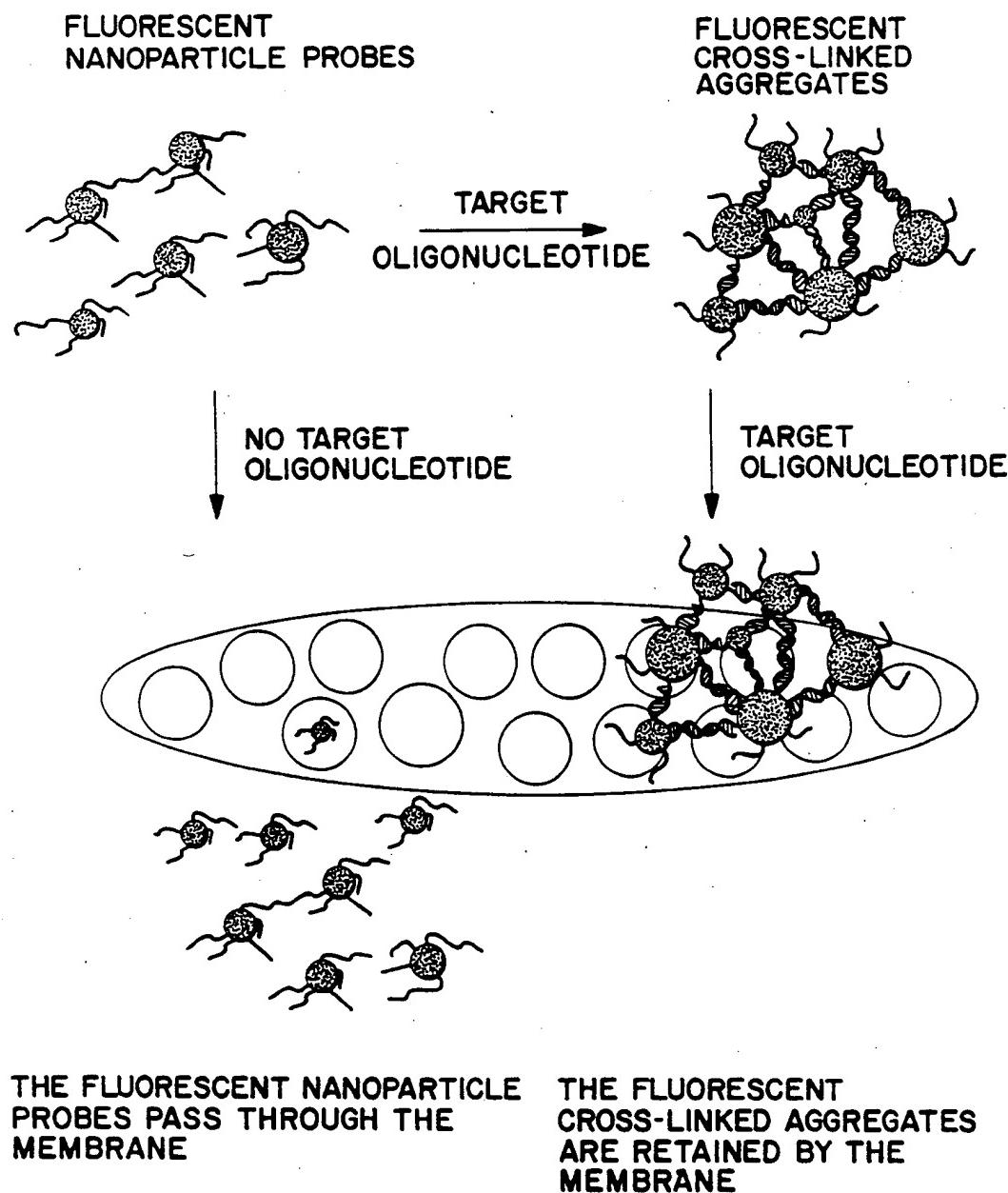


FIG. 23

Anthrax PCR Product

5'G GCG GAT GAG TCA GTA GTT AAG GAG GCT CAT AGA GAA GTA ATT AAT
3'C CGC CTA CTC AGT CAT CAA TTC CTC CGA GTA TCT CTT CAT TAA TTA

TCG TCA ACA GAG GGA TTA TTG TTA AAT ATT GAT AAG GAT ATA AGA AAA
AGC AGT TGT CTC CCT AAT AAC AAT TTA TAA CTA TTC CTA TAT TCT TTT

ATA TTA TCC AGG GTT ATA TTG TAG AAA TTG AAG ATA CTG AAG GGC TT 3'
TAT AAT AGG TCC CAA TAT AAC ATC TTT AAC TTC TAT GAC TTC CCG AA 5'

141 mer Anthrax PCR product [SEQ ID NO:36]

3' CTC CCT AAT AAC AAT

[SEQ ID NO:37]

3' TTA TAA CTA TTC CTA

[SEQ ID NO:38]

Oligonucleotide-Nanoparticle Probes

Blocker Oligonucleotides

3' C CGC CTA CTC AGT CAT CAA TTC CTC CGA GT

[SEQ ID NO:39]

3' A TCT CTT CAT TAA TTA AGC AGT TGT

[SEQ ID NO:40]

3' TAT TCT TTT TAT AAT AGG TCC CAA TAT

[SEQ ID NO:41]

3' AAC ATC TTT AAC TTC TAT GAC TTC CCG AA

[SEQ ID NO:42]

FIG. 24

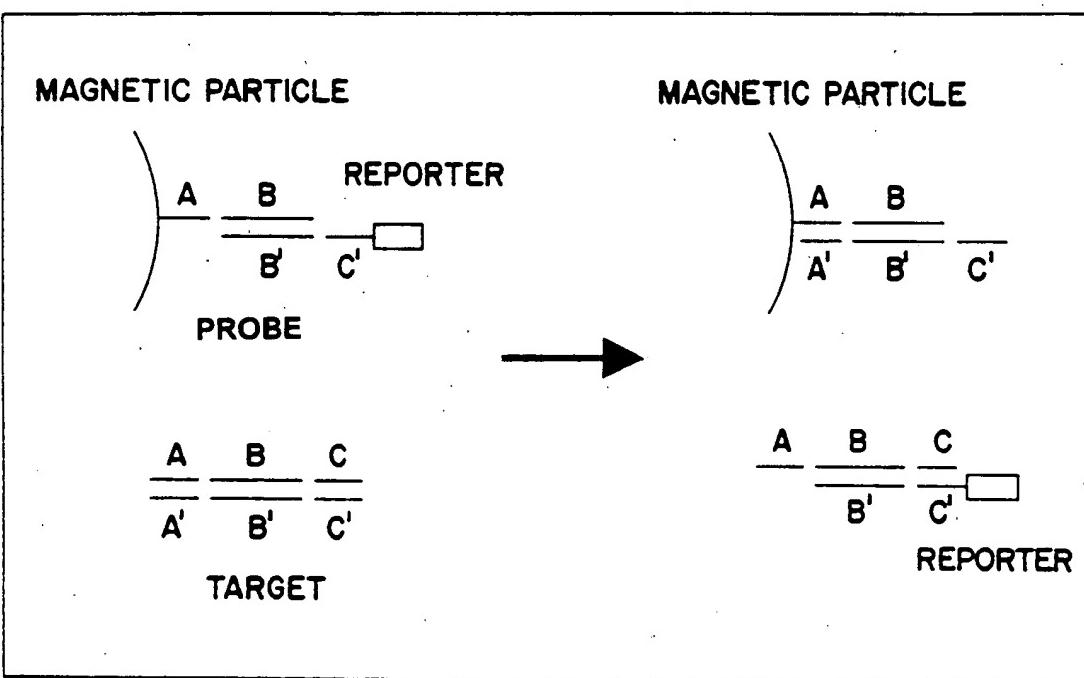
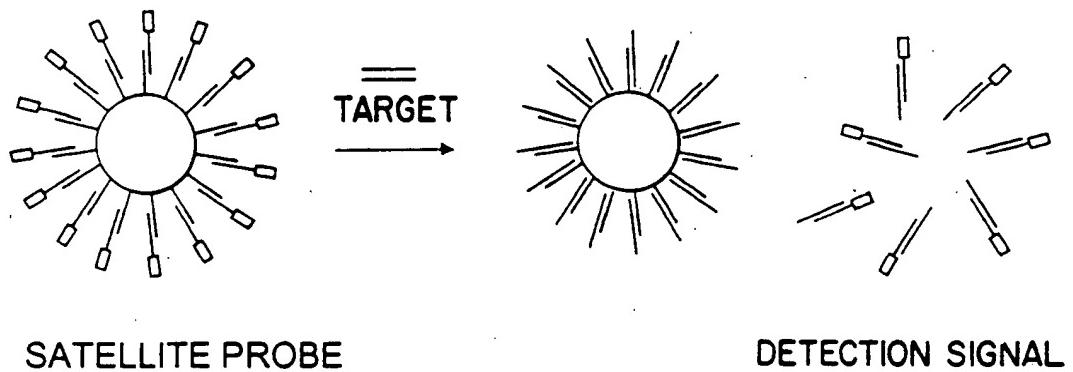


FIG. 25A

1. ~~~ (TARGET)

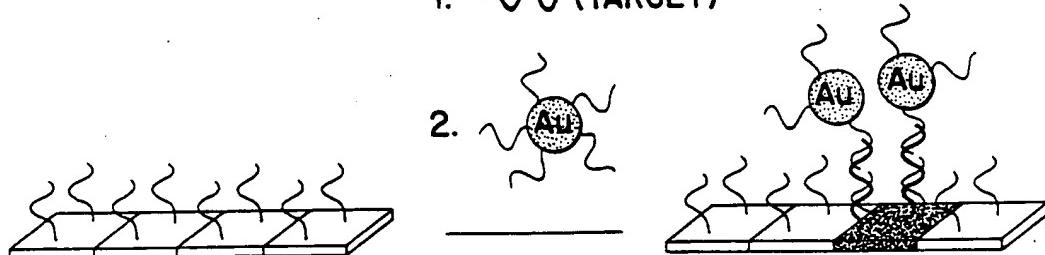


FIG. 25B

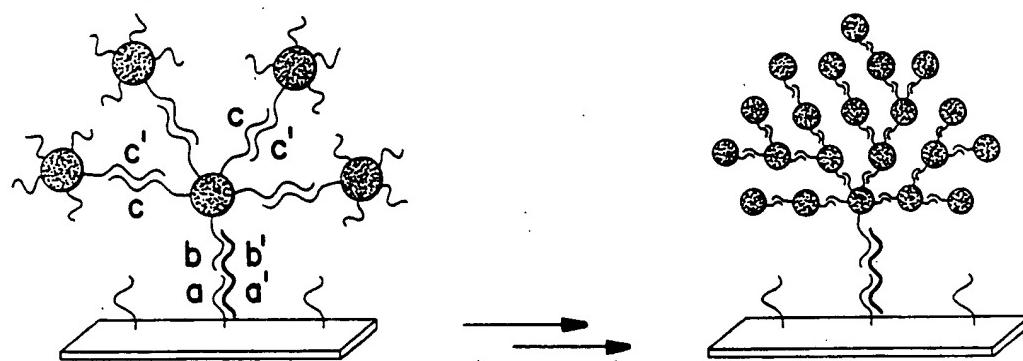
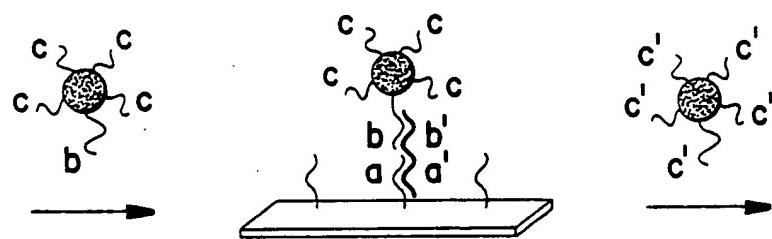
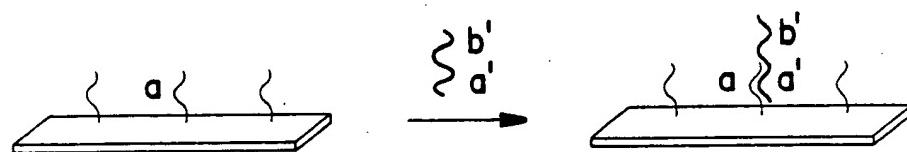


FIG. 26A

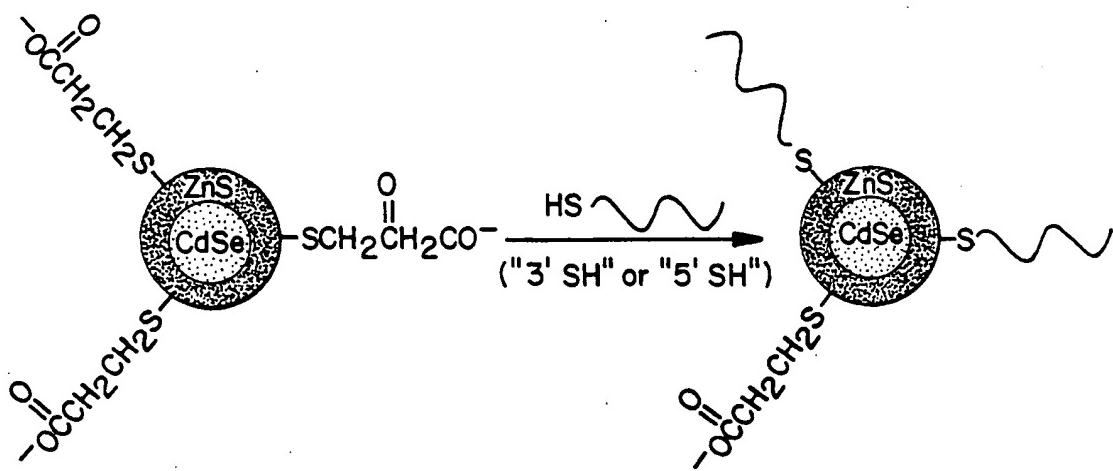


FIG. 26B

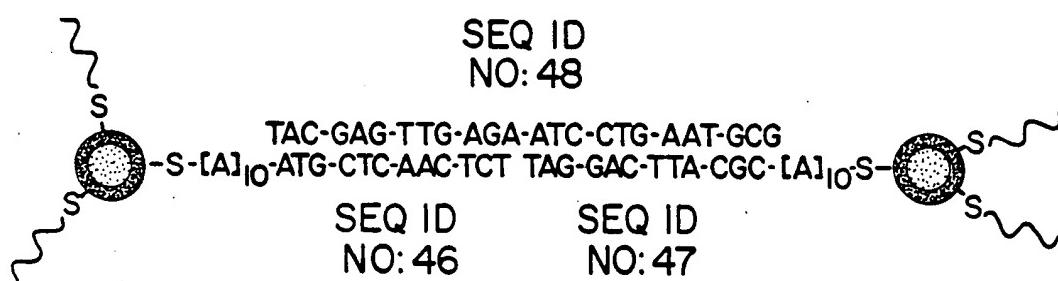


FIG. 27A

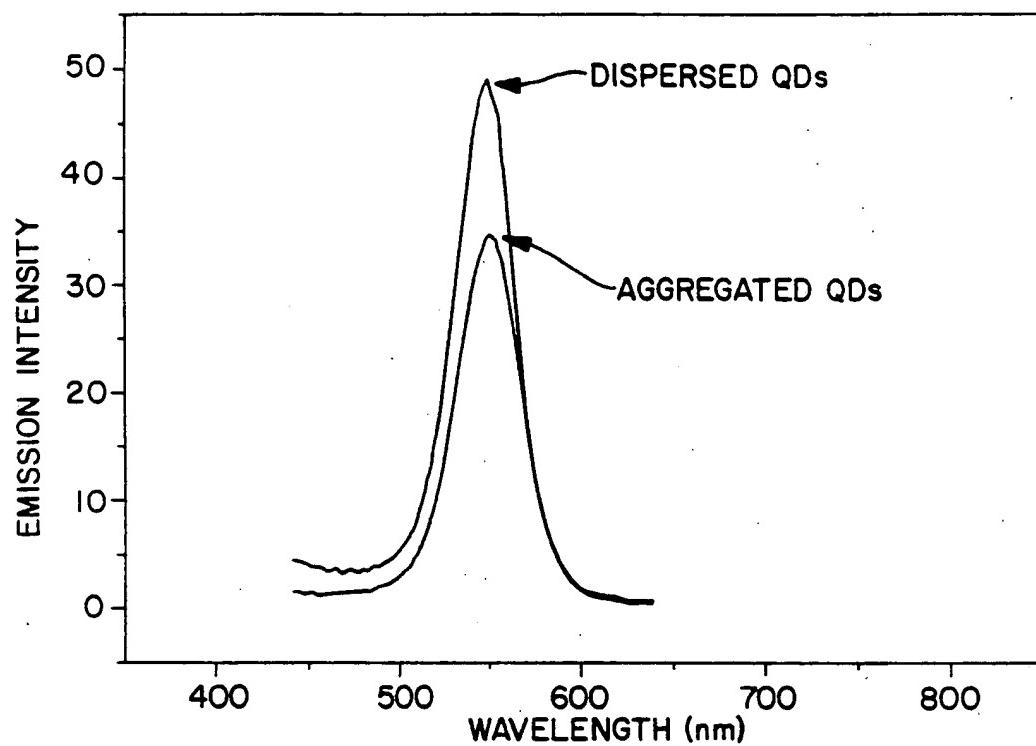


FIG. 27B

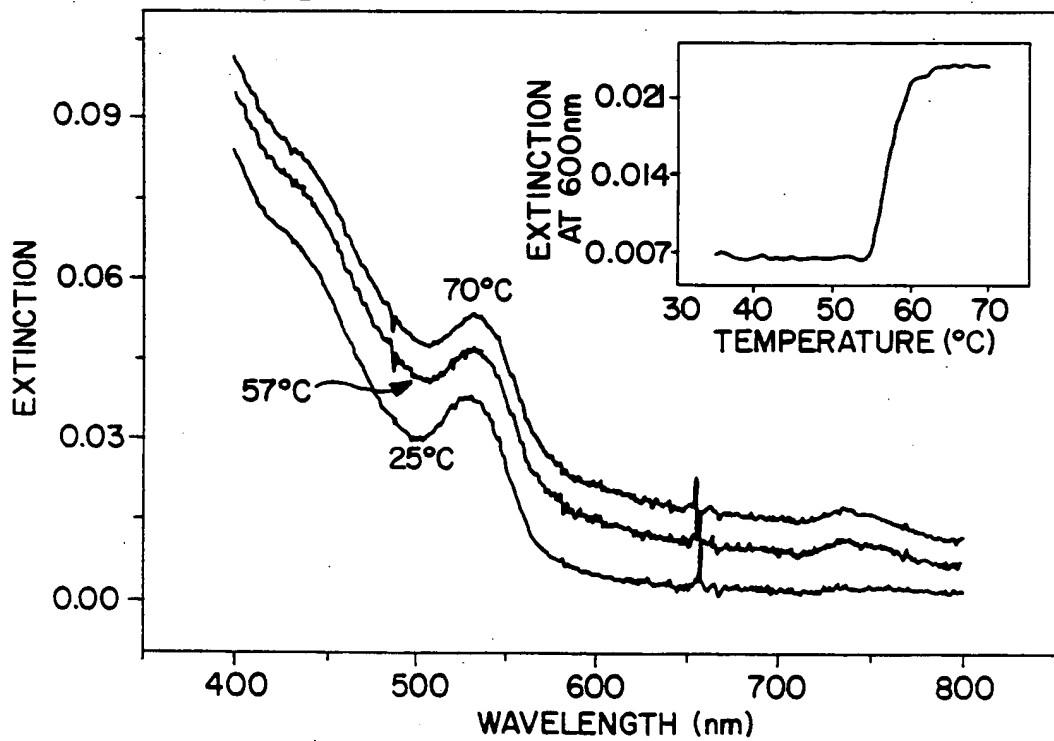


FIG. 27C

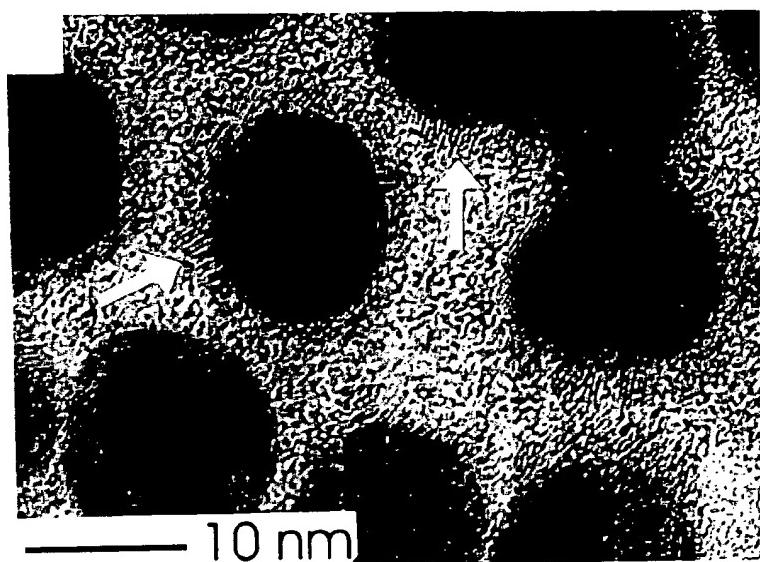


FIG. 27D

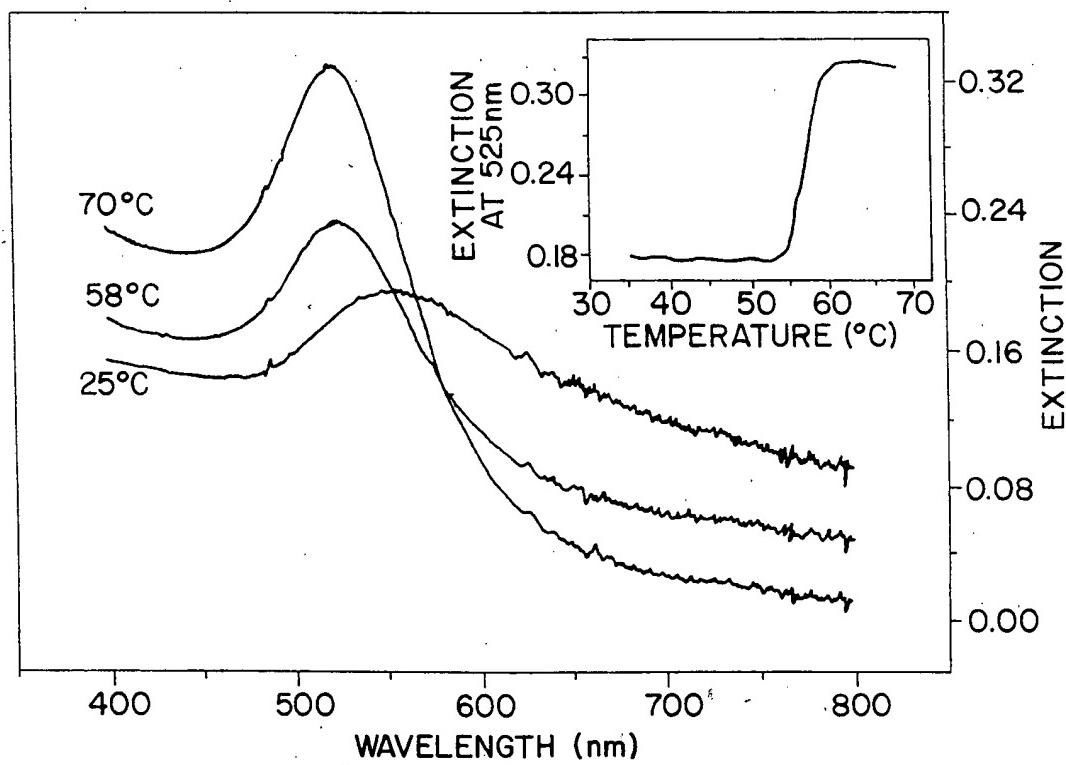


FIG. 28A

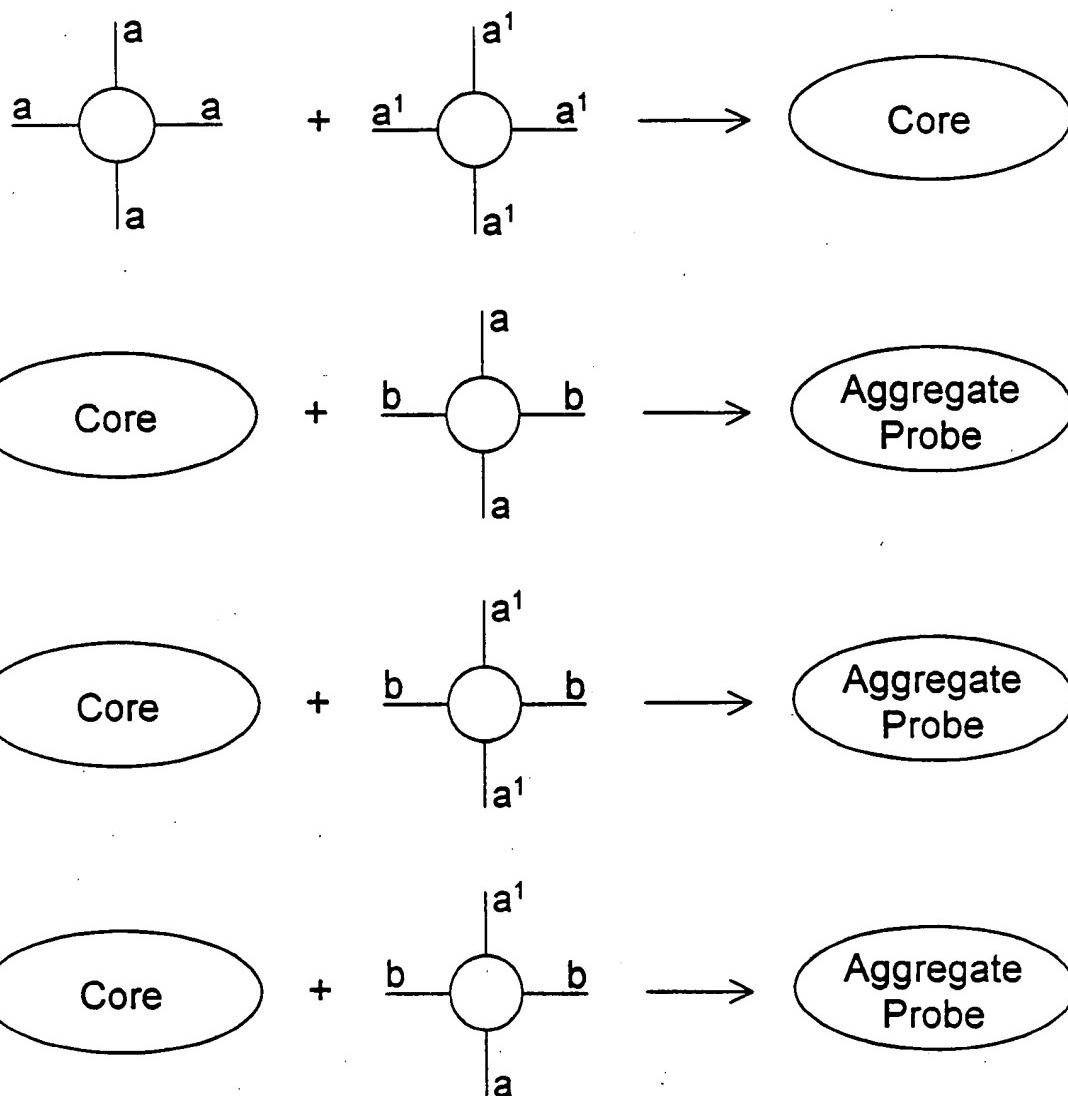


FIG. 28B

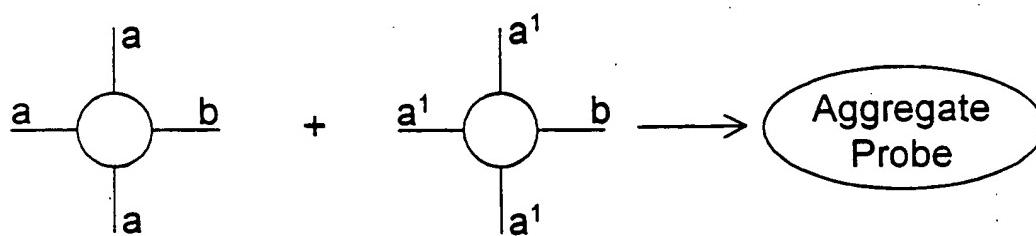


FIG. 28C

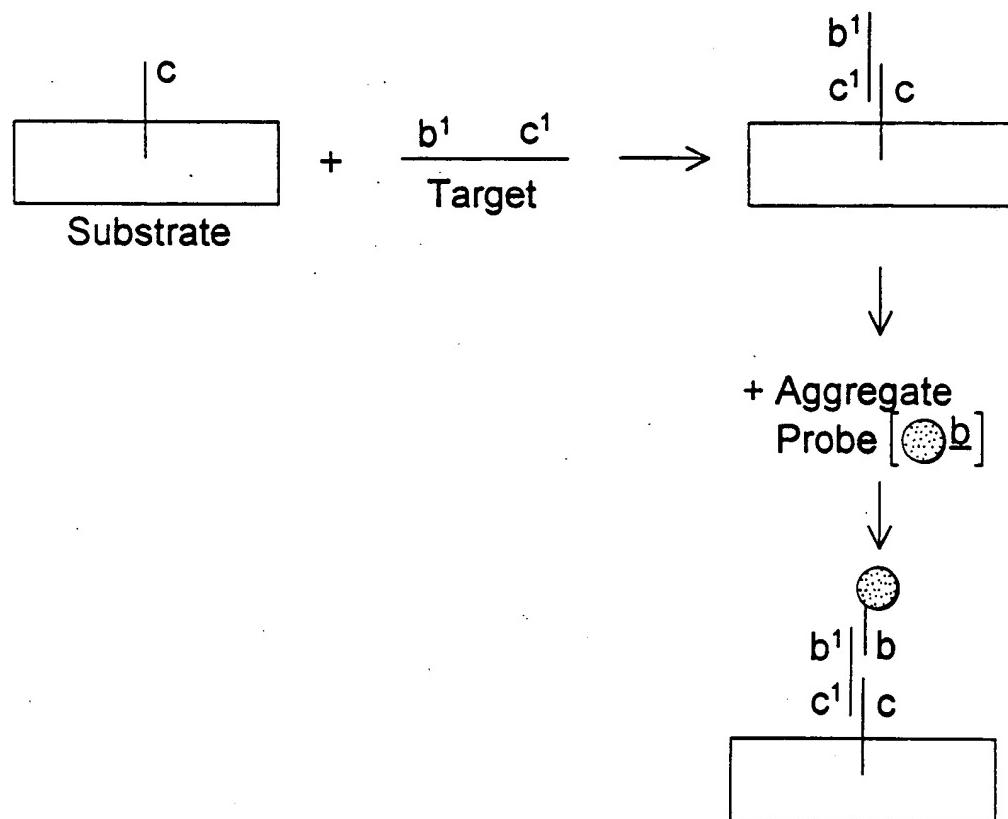


FIG. 28D

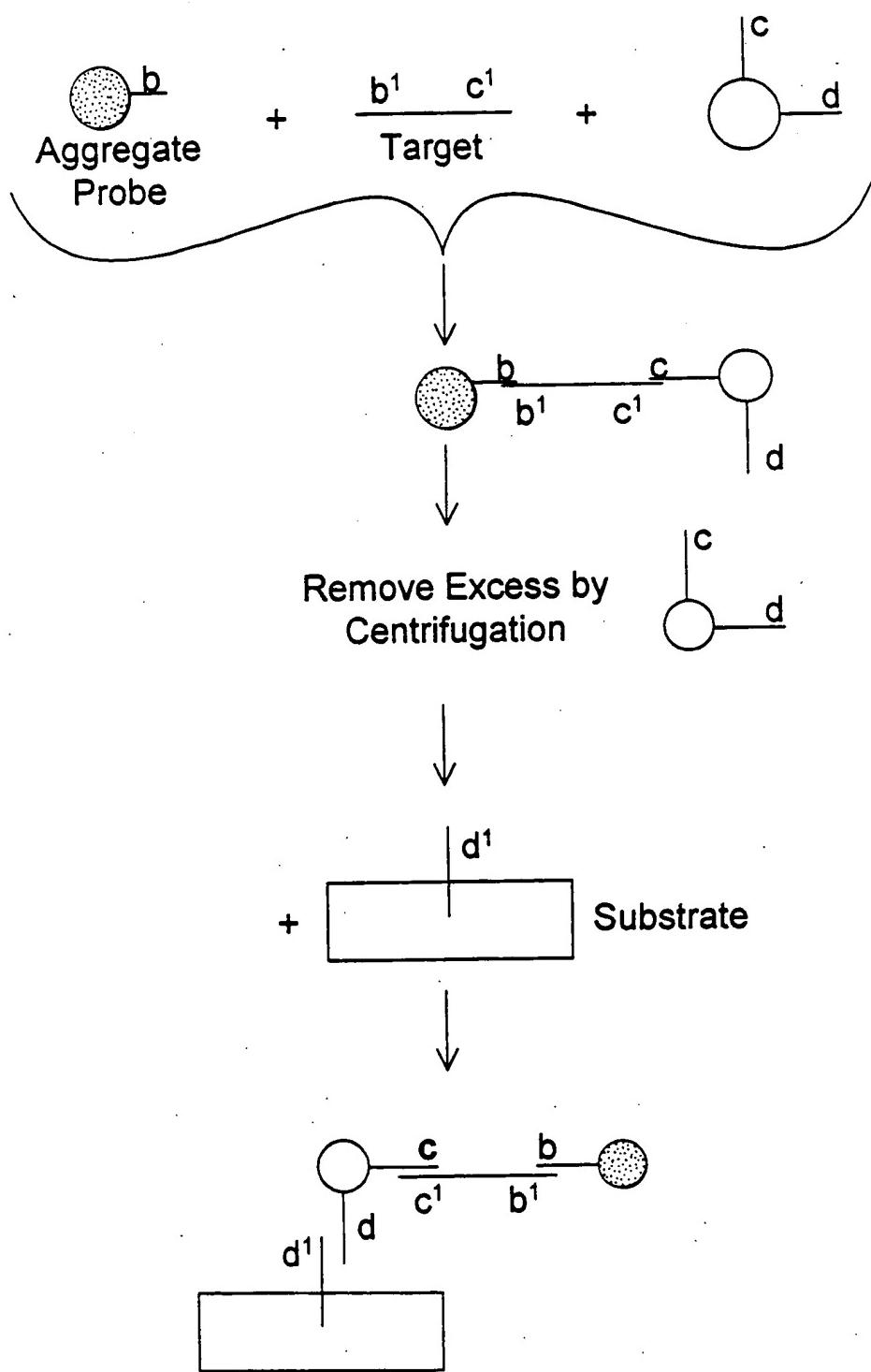
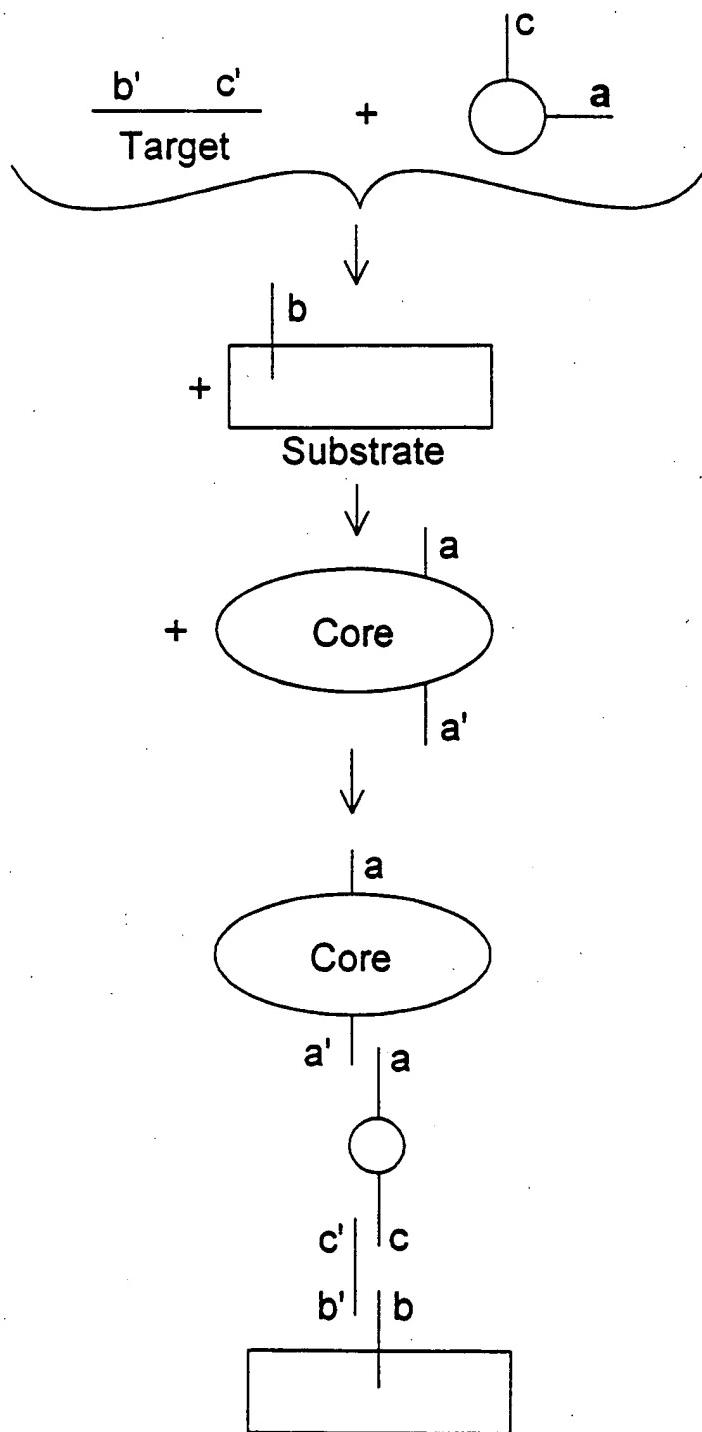


FIG. 28E



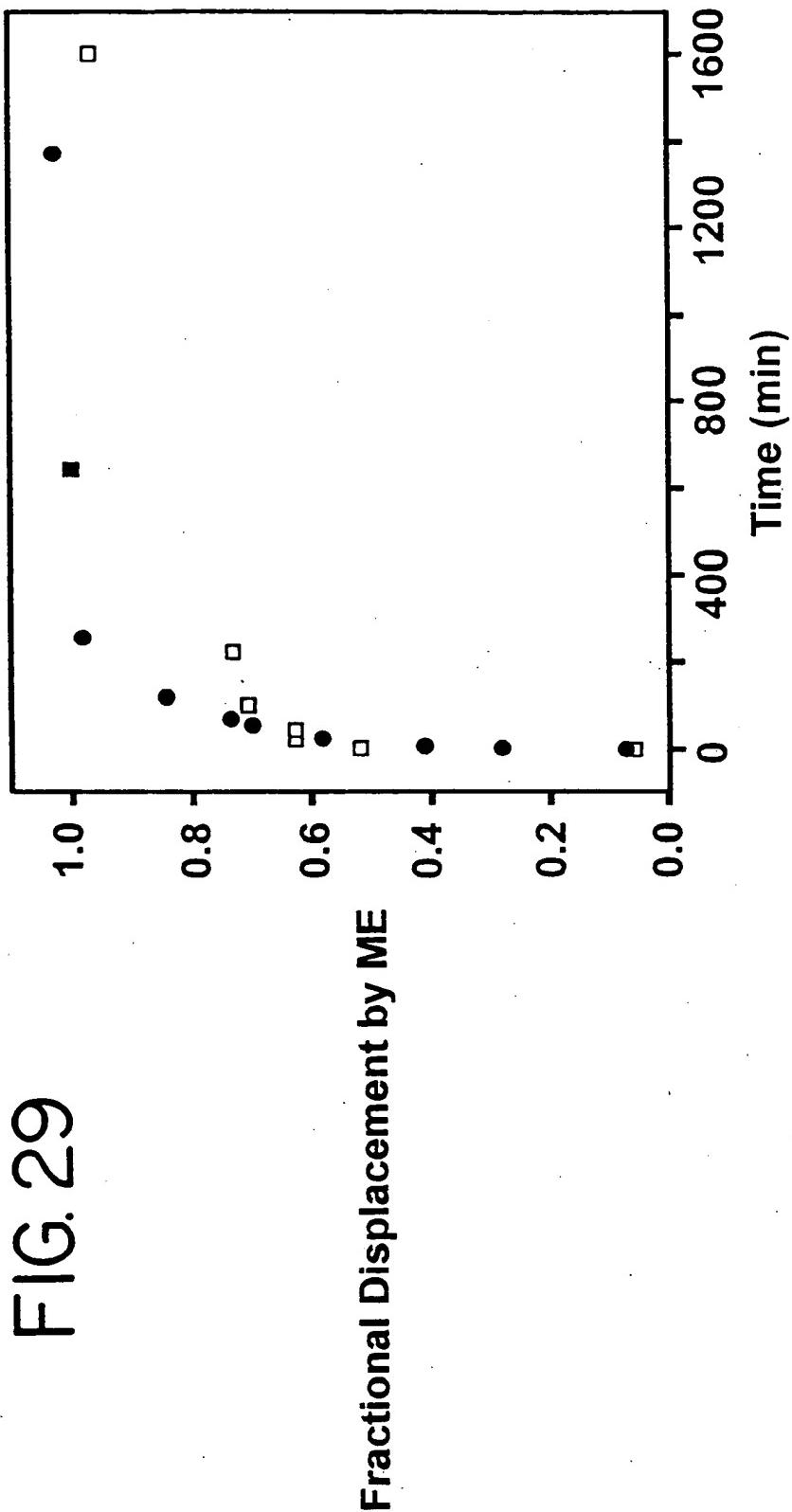


FIG. 30

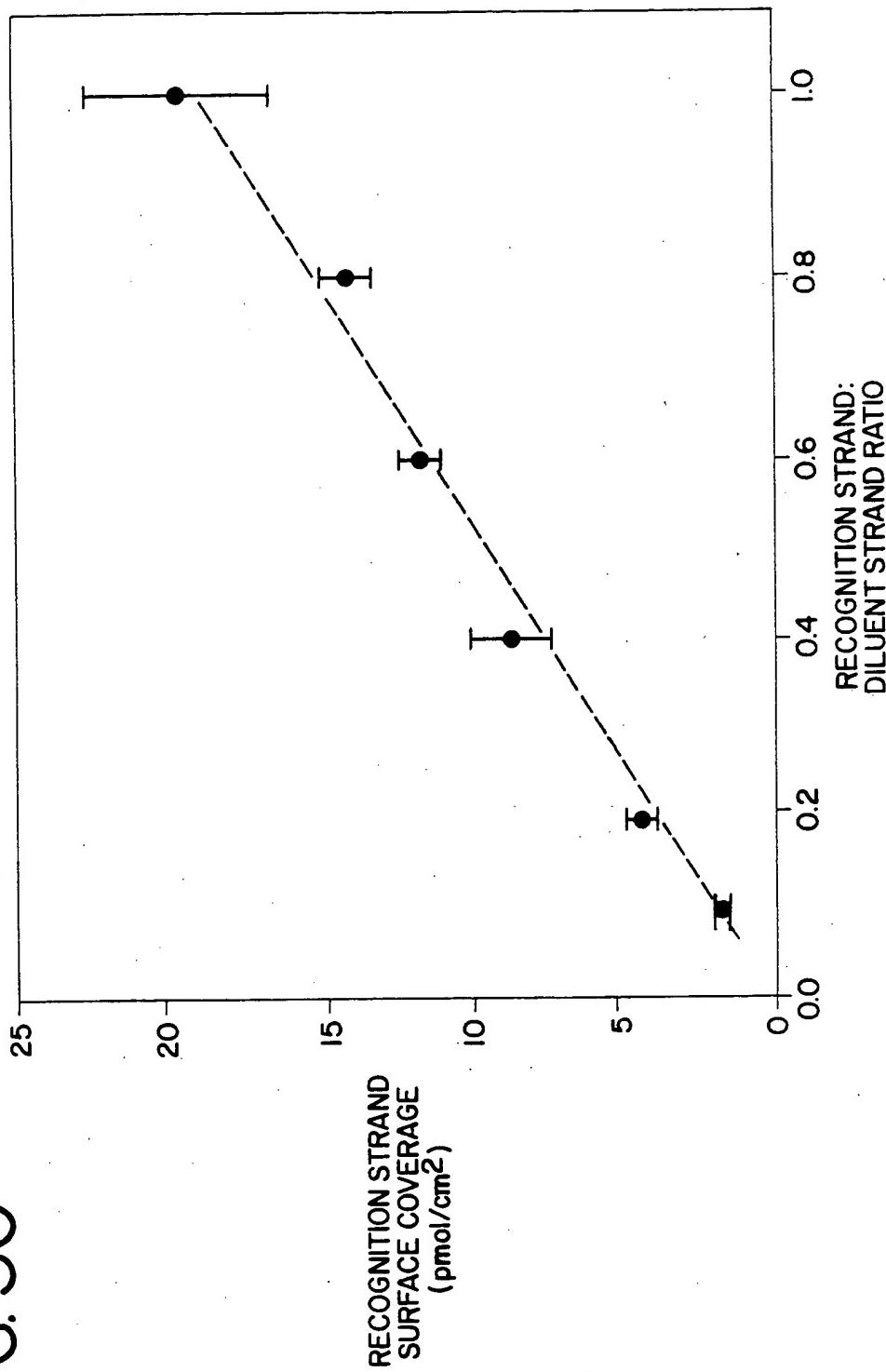


FIG. 3|

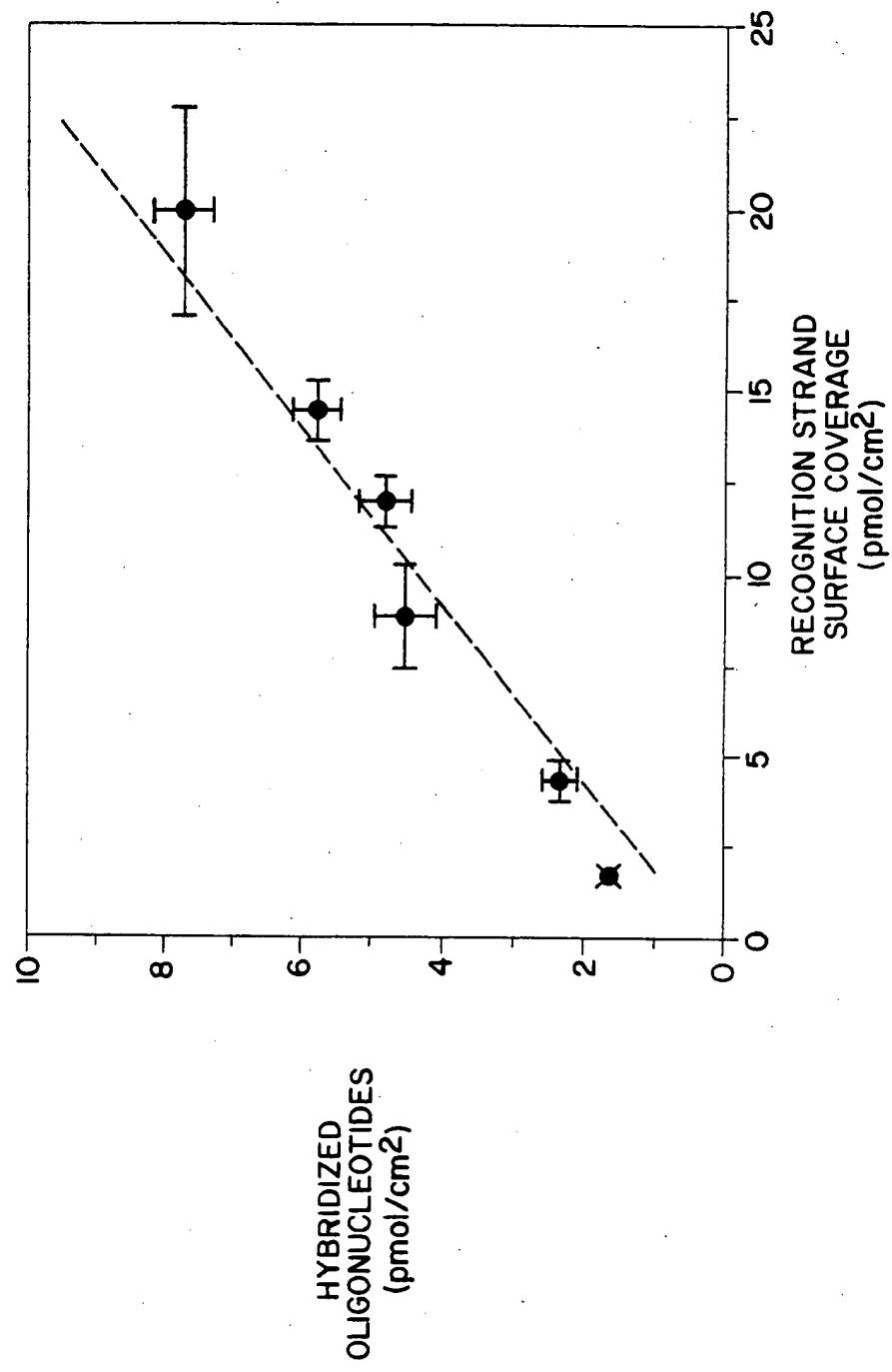
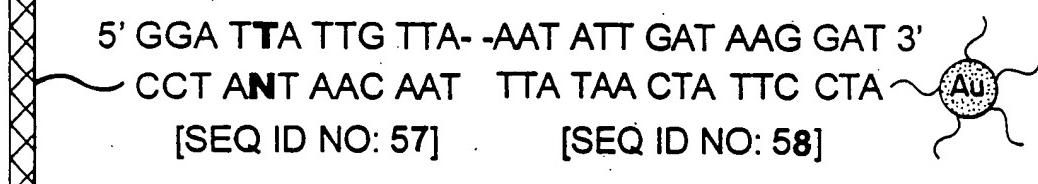


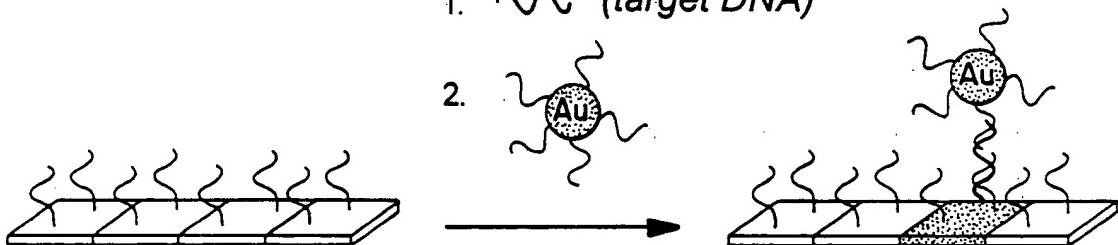
FIG. 32

[SEQIDNO:56]

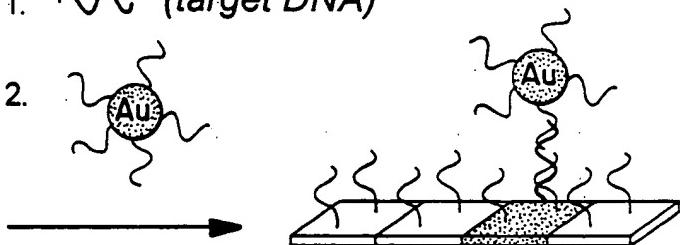


N = A (complementary),
G,C,T (mismatched)

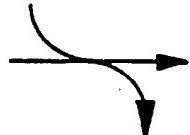
1. ~~~ (target DNA)



2.



Ag^+
hydroquinone
(pH 3.8)



$\text{Ag}(s)$
quinone

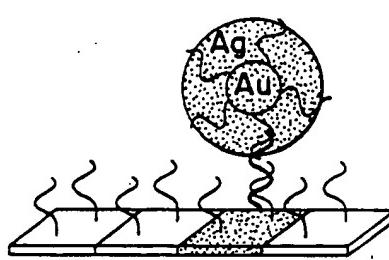


FIG. 33



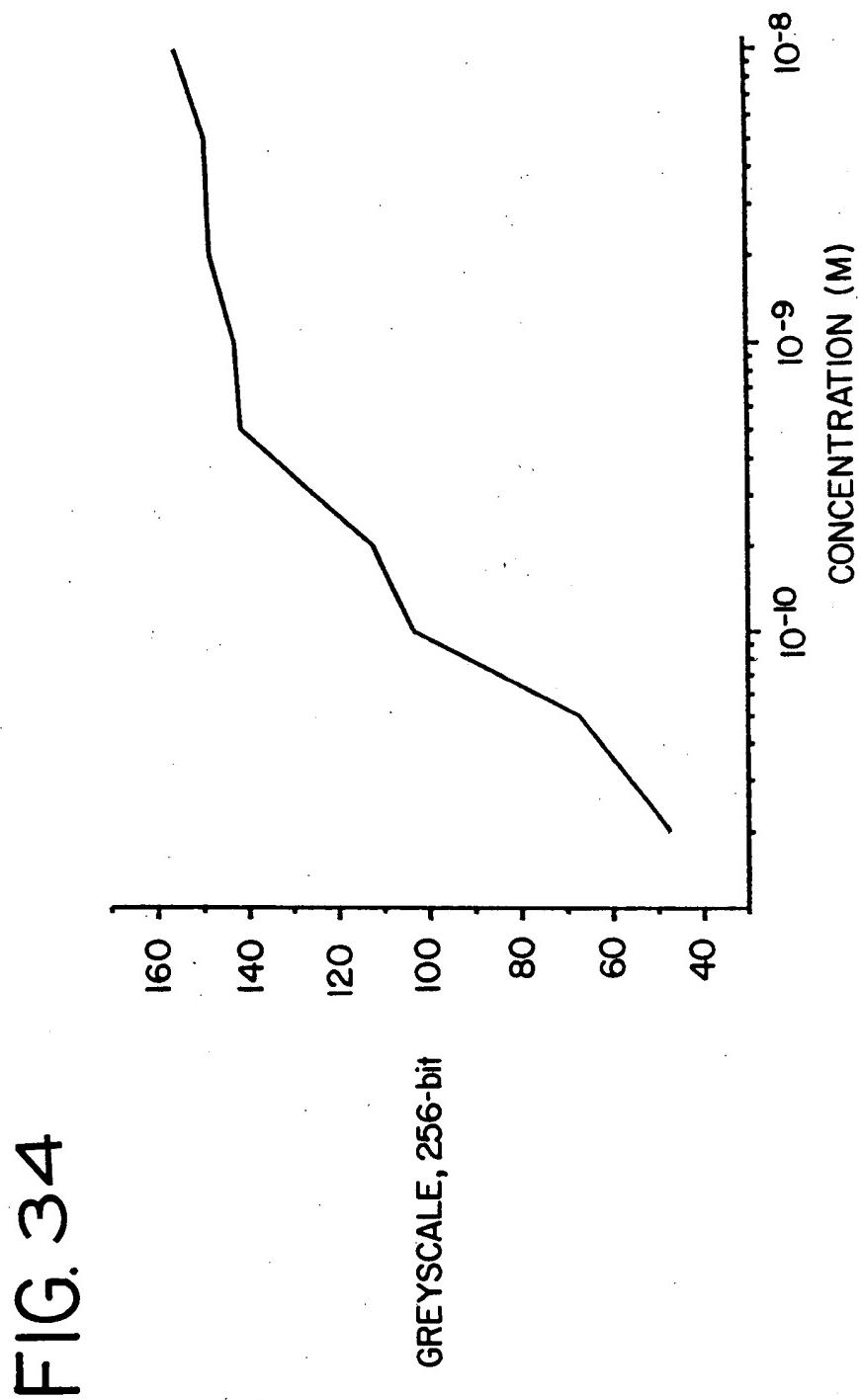


FIG.35A

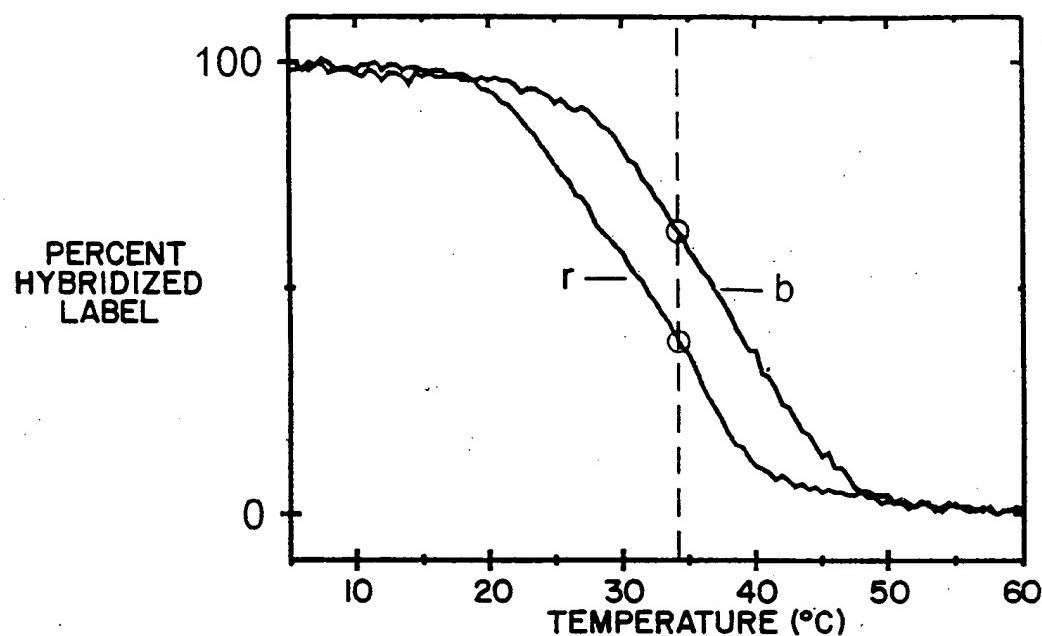


FIG.35B

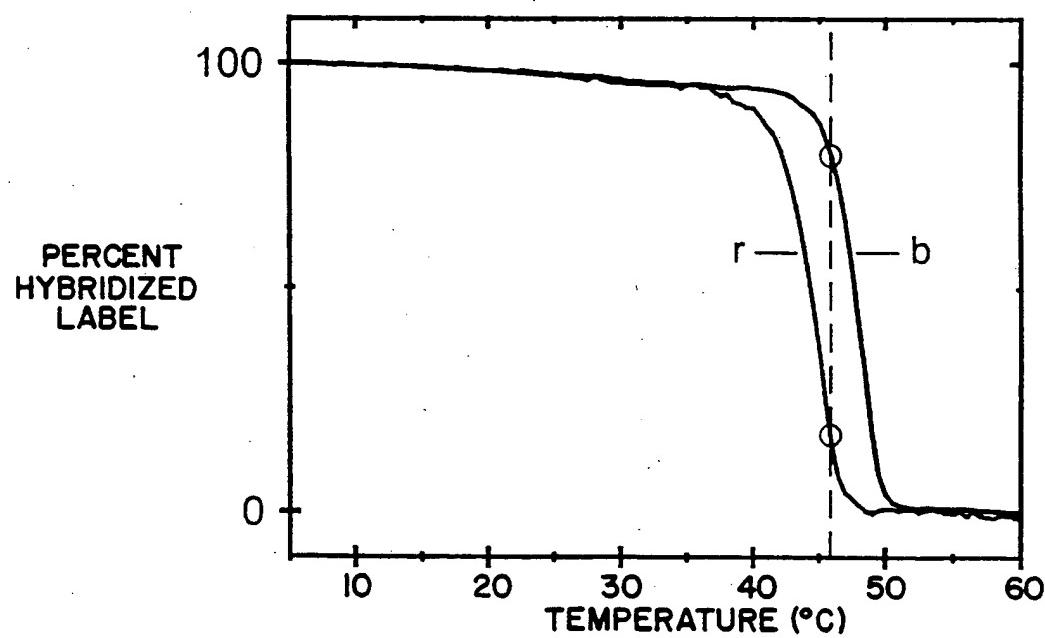


FIG. 36A



FIG. 36B



C A T G

FIG.37A

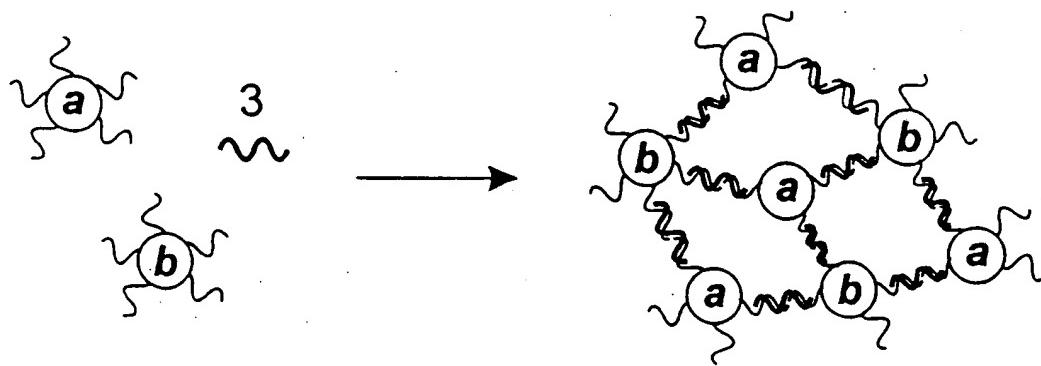


FIG.37B

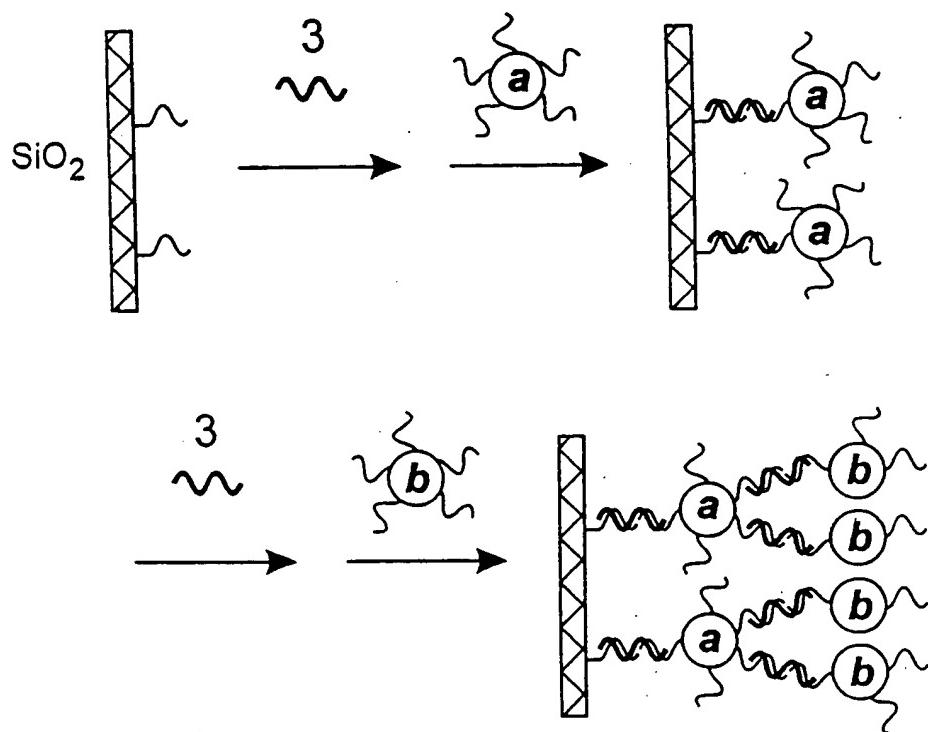


FIG. 38A

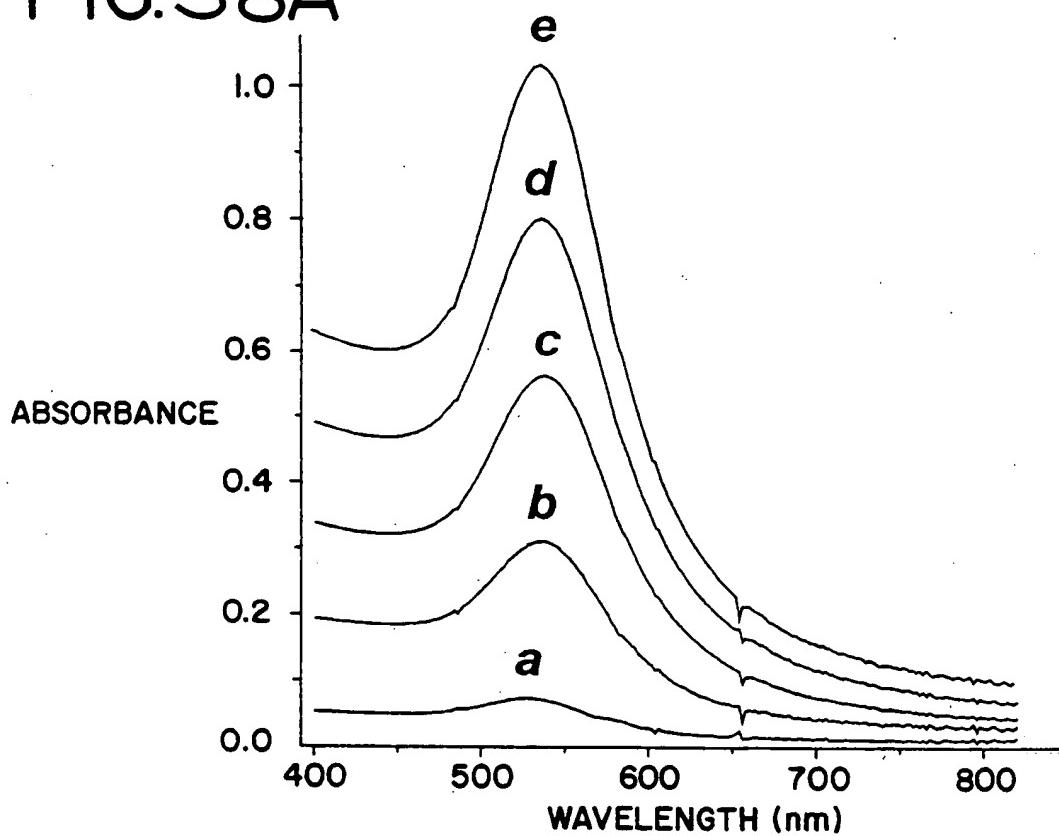


FIG. 38B

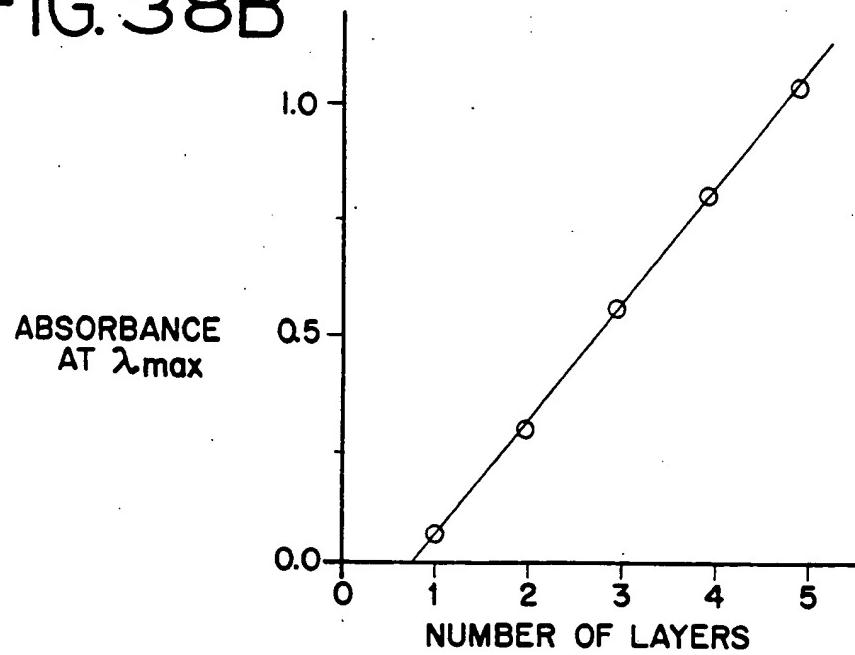
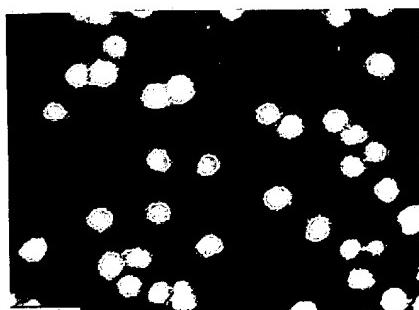
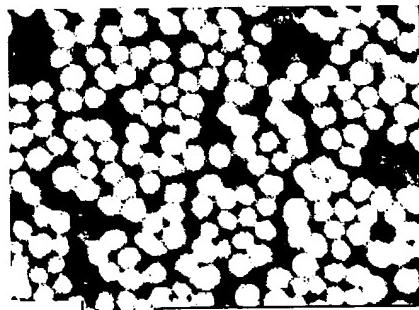


FIG. 39A



A ● — 50 nm

FIG. 39B



B ● — 50nm

FIG.39C

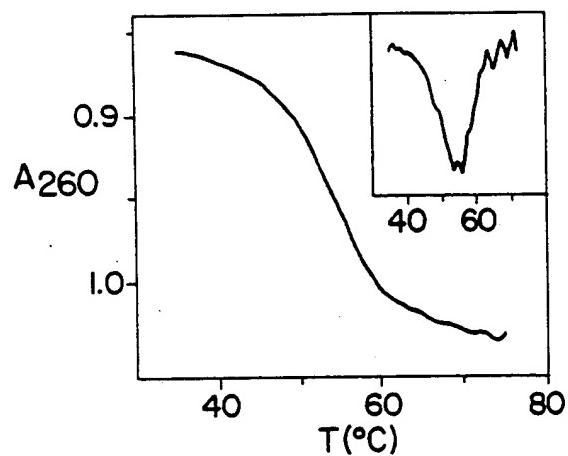


FIG.39D

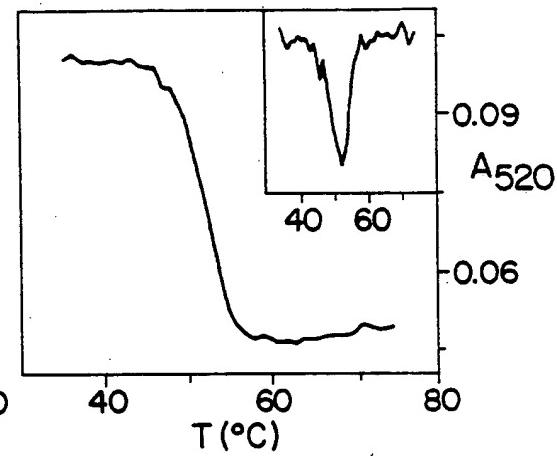


FIG.39E

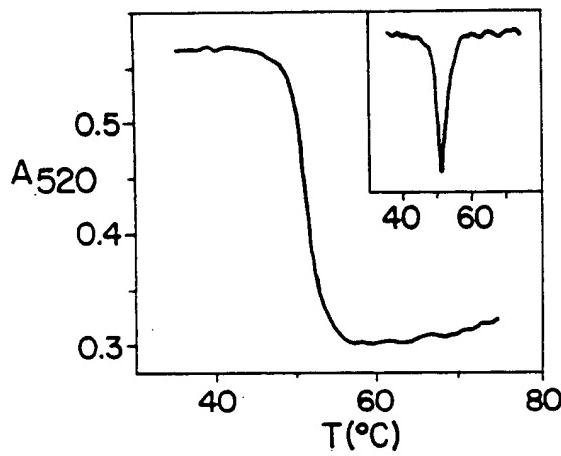


FIG.39F

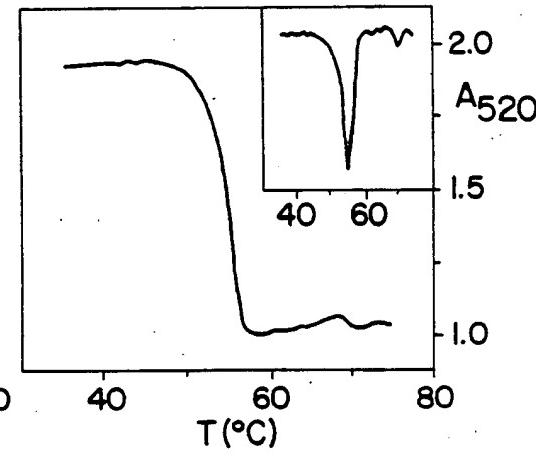


FIG. 40

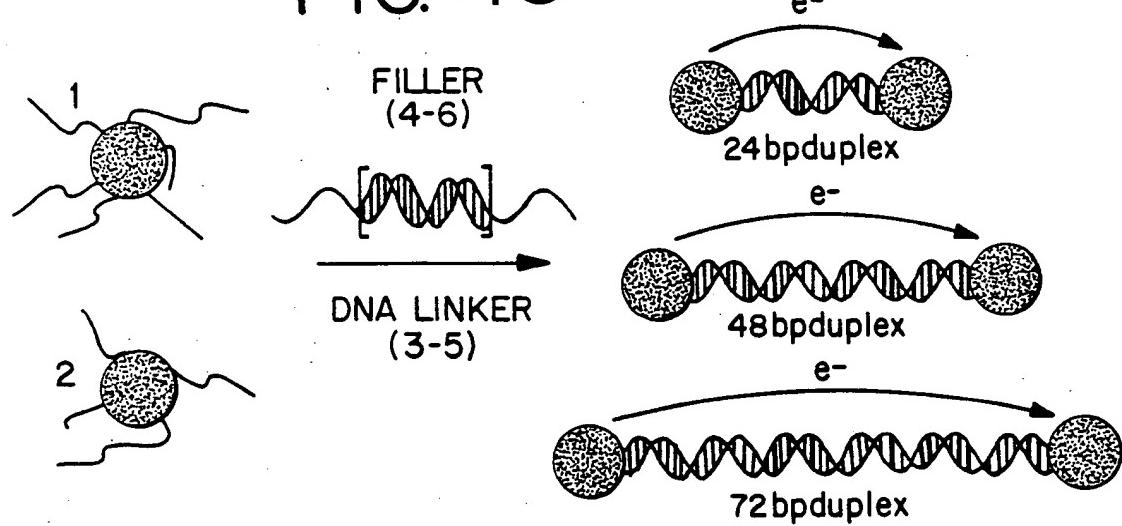


FIG. 41

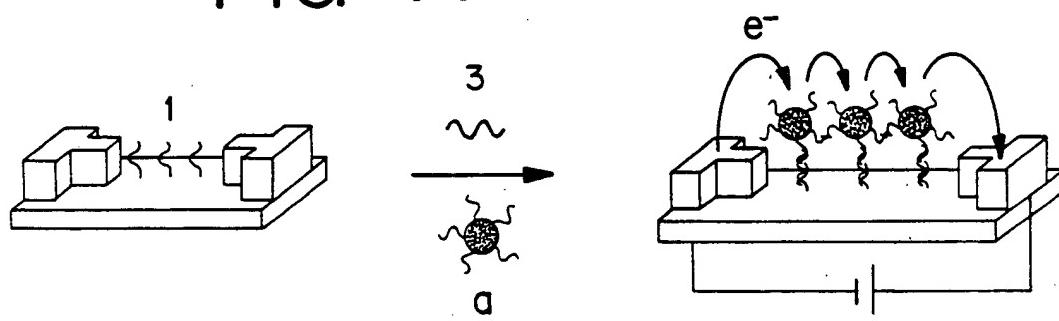
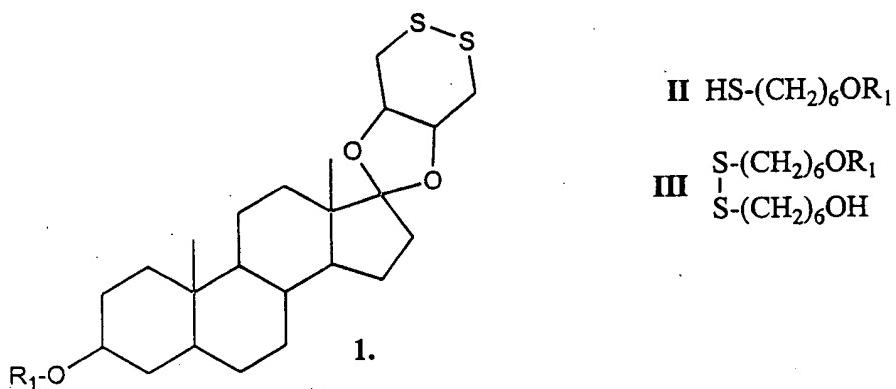


FIG. 42



R_1

a = H

b = $(iPr)_2NP(OCH_2CH_2CN)$ -

c1 = 5'-p(A_{20})-TATCGTTCCATCAGCT [SEQ ID NO: 65]

c2 = 5'-p(A_{20})-TTGATCTTCCGTTCT [SEQ ID NO: 66]

Target I = 79-mer oligonucleotide with target region:

3'.....ATAGCAAGGTAGTCGAGCAACTAGAAAGGCAAGA.....5'
[SEQ ID NO: 67]

FIG. 43

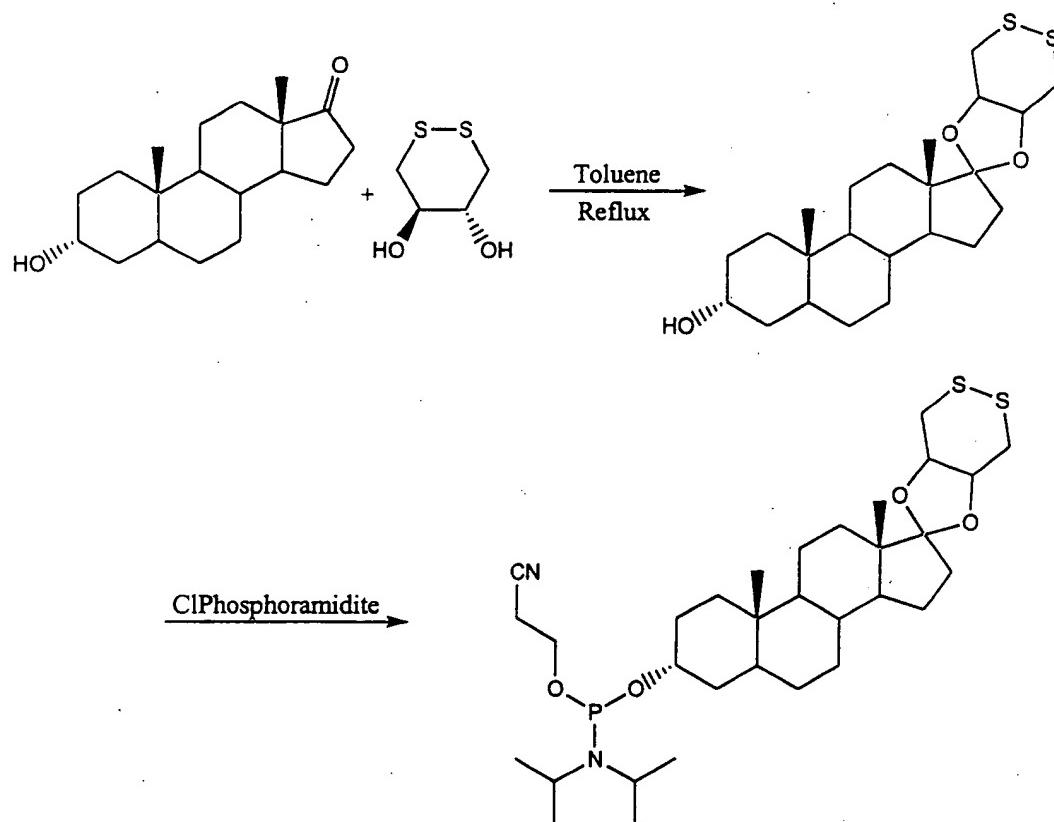
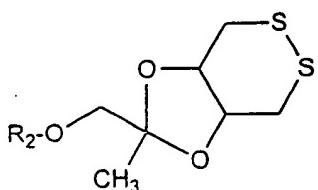


FIG. 44



2.

R₂

a = H

b = (iPr)₂NP(OCH₂CH₂CN)-

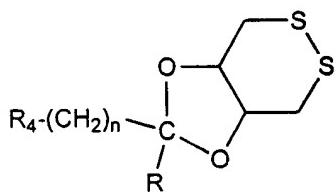
c1 = 5'-p(A₂₀)-GCAGACCTCA [SEQ ID NO: 68]

c2 = 5'-p(A₂₀)-CCTATGTGTCG [SEQ ID NO: 69]

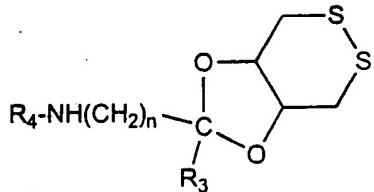
D = 5'-p(A₂₀) [SEQ ID NO: 70]

Target I = 63-mer oligonucleotide with target region:

3'.....CGTCTGGAGTGGATACACAGC.....5'
[SEQ ID NO: 71]



3.



4.

R₃ = hydrogen, an alkyl group, an aryl group, or a substituted alkyl or aryl group

R₄ = an attached oligonucleotide or modified oligonucleotide

FIG. 45

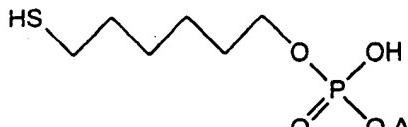
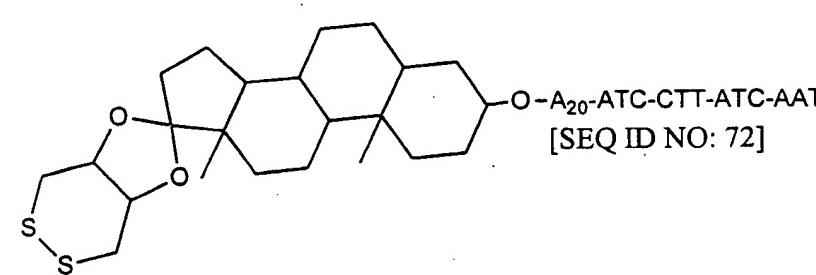
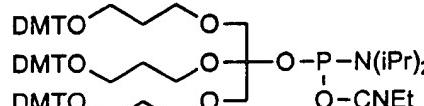
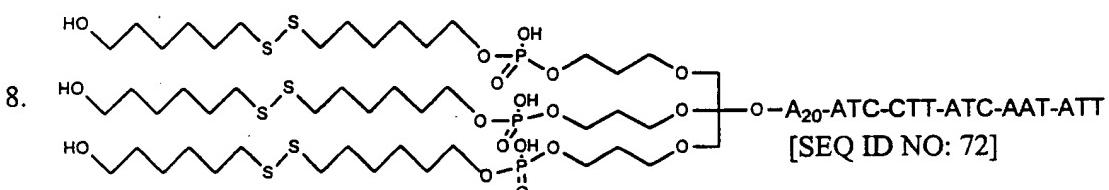
5. 
[SEQ ID NO: 72]
6. 
[SEQ ID NO: 72]
7. 
8. 
[SEQ ID NO: 72]

FIG. 46

